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A.M.A. SESSION • ATLANTIC CITY, N. J. • JUNE 7-11, 1937

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SIGNIFICANCE OF THE TUBERCULIN TEST

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AND
N. M. LEVINE, M.D.
MINNEAPOLIS

The incidence of positive reactors to tuberculin among the children and young adults is the best criterion of the tuberculosis problem in any community. It is far superior to mortality rates, since many persons who have tuberculosis die of other causes and the death certificates do not record the coexisting tuberculosis. One has only to consult postmortem records to obtain abundant evidence of this fact. Moreover, the morbidity rate does not approach the accuracy of the tuberculin test as a criterion of the tuberculosis problem, since, in approximately 80 per cent of patients, symptoms are a late manifestation and do not bring patients to physicians for diagnosis until the disease is well advanced. Indeed, there is an average period of approximately two and one-half years before symptoms appear during which the disease can be located by modern methods. In most cases there is a much longer period after the tuberculin test is positive before there is any evidence of disease on the x-ray film.

In 1926 we [1] published the results of tuberculin testing among school children in the city of Minneapolis, which showed that, of 2,118 tested, 47.33 per cent reacted positively. In the ten years that has passed since this work was done, much effort has been put forth and large sums of money have been spent to protect girls and boys against contamination with tubercle bacilli. While a good pasteurization ordinance was in effect in 1926, considerable milk that was not pasteurized was consumed by children, particularly when they were out of the city on vacations, and like instances. The pasteurization ordinance has continued in effect during the past ten years and in addition tuberculin testing of cattle has gone forward until the state of Minnesota has been accredited with reference to tuberculosis among cattle. Thus, contamination of children by the bovine type of tubercle bacillus, which results in a positive tuberculin reaction just as truly as the human type, has practically disappeared. The number of beds in the county sanatorium has been increased to approximately 700. While there were 500 beds in this institution in 1926, an additional 200 has been added; this additional 200 is more beds for the tuberculous than exist in some whole states. The United States Veterans' Bureau has developed a hospital for 176 beds for the tuberculous. However, this institution admits patients from other parts of this state and from other states. Most of the general hospitals have opened their doors to tuberculous patients so that physicians can isolate and treat their private patients. In addition to the facilities for isolation, ambulatory artificial pneumothorax has definitely increased in popularity on the basis of results obtained, and many persons have had their lesions treated in this manner before they became spreaders of tubercle bacilli, while many others with tubercle bacilli in the sputum have had their lesions quickly controlled and the sputum rendered negative. Thus a vigorous effort has been put forth to isolate patients with tuberculosis in sanatoriums and hospitals and to treat them in the homes so as to prevent them from spreading bacilli to their human associates.

The most outstanding work is the epidemiology that has been practiced over this period of years. As soon as a case of clinical tuberculosis is reported, an earnest attempt is made, first, to find the source of the disease; that is, to find the person with tuberculosis who spread tubercle bacilli to the present patient. In fact, 26 per cent of the cases of clinical tuberculosis reported to the health department in 1932 were detected in this manner.[2] An attempt is made secondly to examine adequately all the immediate contacts who may have been contaminated by the present patient. When such contacts are not found to have tuberculosis in clinical form they are kept under close observation and examined periodically. This is done by private physicians for those who are financially able; for all others adequate clinics have been provided. It is not at all infrequent to find that the chest of a contact reacting positively to the tuberculin test and entirely negative to x-ray films and physical examination subsequently shows small shadows which make their appearance on the x-ray film long before symptoms or abnormal physical signs are present and long before tubercle bacilli are being eliminated in the sputum. Thus, many lesions which without such observation would become extensive and spread tubercle bacilli are brought under control without ever causing the patient any illness or being a menace to the individual's associates.

Another phase of the epidemiologic work which has been extremely valuable consists of the use of the tuberculin test among children, many of whom had no known contact with open cases of tuberculosis. By finding

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From the Departments of Preventive Medicine and Internal Medicine, University of Minnesota, and the Lymanhurst Health Center.

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1. Harrington, F. E., and Myers, J. A.: Studies on Tuberculosis in Infancy and Childhood: X. Tuberculous Infection Among Minneapolis School Children as Revealed by the Intracutaneous Test, Am. Rev. Tuberc. **14**: 454 (Oct.) 1926.

2. Myers, J. A.: The Epidemiology of Tuberculosis, J. Outdoor Life **31**: 50, 1934.

the positive reactors and tracing back to the family and other close associates, many cases of open tuberculosis previously undiagnosed have been brought to light. In fact, in a special chest clinic at the Lymanhurst Health Center, provisions have been made whereby x-ray films and clinical examinations are made of the chest of indigent persons. Moreover, physicians who have patients who can pay them a small fee but cannot afford x-ray films of the chest are permitted to send such patients to this clinic for free x-ray work. Indeed, during the present year x-ray film examinations have been made of approximately 5,000 persons in this clinic.

In addition to this method of finding unsuspected cases, the school board passed an order in 1933 requiring all employees of the school system to be adequately examined for tuberculosis. Thirty-six hundred such employees were examined, sixty-eight of whom showed shadows on the x-ray film which required clinical examination and observation to determine whether they were cast by tuberculous lesions and if so whether they were in a progressive or communicable stage. At the time this work was reported,[3] six employees were found to have tubercle bacilli in the sputum and, since, two others have become spreaders of tubercle bacilli. The remainder are still under observation. While this number of communicable cases of tuberculosis may seem small, it is not difficult to conceive of them spreading tubercle bacilli to large numbers of girls and boys in the school system, since it has been estimated that one patient with open tuberculosis may eliminate from thirty to forty million tubercle bacilli daily.

Moreover, a very fine educational program for physicians has been carried on during the past few years in which the department of health, the local medical society and the county tuberculosis association have cooperated. Tuberculin syringes were presented to each physician in the county and every two weeks tuberculin in a dilution of 1:1,000 is delivered free of charge to the office of each physician who desires to use it. Free tuberculin to physicians for testing is not a new idea. In 1893 a law was passed in Denmark which provided for the expenditure by the minister of the interior of $13,500 annually for five years to provide free tuberculin for testing cattle.[4] In our present program this has resulted in large numbers of tuberculin tests being administered by private physicians, whether engaged in special or general phases of medical practice, and many of the persons reacting positively to the test have had adequate subsequent examinations to determine whether tuberculosis is present in clinical form. This work by the private physicians has not only uncovered many previously unsuspected cases of tuberculosis but has also been of great educational value to the public, particularly with reference to the contagiousness of tuberculosis.

In Minneapolis, as in most cities, the work of controlling tuberculosis has of necessity been fragmentary. Not enough public health education has yet been possible to convince all persons of the value of periodic examinations for tuberculosis. Funds are not available to carry out an ideal program among the indigent, but it is obvious that, if the work which is already under way could be extended to every home and every individual and proper cooperation were afforded, all the foci which are spreading tubercle bacilli could be quickly treated or isolated. The potential communicable cases could be kept under very close observation and in a relatively short time there would be no spreaders of tubercle bacilli.

Even though an ideal program has not been possible, we were convinced that much had been done to prevent the spread of tubercle bacilli and that the tuberculosis problem had been definitely decreased. To measure the effectiveness of the program in the past, we had at our command a method that would give us very definite information; namely, the tuberculin test.

Soon after Koch[5] presented tuberculin in 1890 it was learned that the dose recommended by him both for diagnostic and for therapeutic work often resulted in severe and harmful reactions. He used the subcutaneous method of administration. However, when Pirquet[6] and Mantoux[7] perfected the epidermal and intradermal tests, the amount of tuberculin used by them was found to be without harm. They were convinced that tuberculin is specific as a diagnostic test and through its use made a revelation that could not have been made in any other manner. While it was true that pathologists had already observed tuberculous lesions in large numbers of persons who had died of other causes, the tuberculin test revealed the fact that a high percentage of apparently healthy girls and boys had been infected with tubercle bacilli by the age of 15 years. We often think of Pirquet and Mantoux as believing that tuberculous infection was almost universal in young adults throughout the world, but this is far from true. Indeed, regarding his own observations, Pirquet[8] said:

> This high percentage cannot be considered as being the figure for all children, as very many cases are admitted into the hospitals because of tuberculosis.

Again he said:

> The percentage of infected (reacting) children is a particularly high one in my table. In other cities it will hardly be as high because tuberculosis is notoriously prevalent in Vienna. Furthermore, all my patients belonged to the poorer classes. My statistics, therefore, lose in some degree their general value. Our children are infected at a much earlier age on account of the prevalence of tuberculosis among their parents. It is necessary to make similar studies in every city in order to ascertain the frequency of tuberculosis in general.

Thus Pirquet recommended the tuberculin test as the method of determining the incidence of contamination with tubercle bacilli in various parts of the world. Since the time of Pirquet and Mantoux the tuberculin test has been used very extensively, and at present it is recognized as a test having no superior in the diagnosis of any disease. Careful experimental studies and close observation on human beings have revealed the fact that when tubercle bacilli grow in the human body during the early stage of tubercle formation their protein sensitizes the tissues of the body. While microscopic evidence of sensitiveness of tuberculoprotein can be detected a short time after tubercle bacilli are introduced into the animal body,[9] it is usually a period of approximately two or more weeks before the tissues are so sensitized as to react positively when tuberculoprotein is brought in contact with the skin through an

3. Harrington, F. E.; Myers, J. A., and Levine, Ida: Tuberculosis Among Employees of the Minneapolis Schools, J. A. M. A. **104:** 1869 (May 25) 1935.

4. Bang, B. L. F.: Tuberculosis of Cattle, Appendix. Pearson, Leonard, and Ravenel, M. P.: Tuberculosis of Cattle and the Pennsylvania Plan for Its Repression, Bull. 75, Dept. of Agriculture, Commonwealth of Pennsylvania, 1901, p. 247.

5. Koch, Robert: The Etiology of Tuberculosis, Berlin. klin. Wchnschr. **19:** 221, 1882.

6. Pirquet, Clemens: Demonstration zur Tuberkulindiagnose durch Hautimpfung, Berlin. klin. Wchnschr. **44:** 699, 1907.

7. Mantoux, Charles: Intradermo-reactions de la tuberculin, Compt. rend. Acad. d. sc. **149:** 355, 1908.

8. Pirquet, Clemens: Frequency of Tuberculosis in Childhood, J. A. M. A. **52:** 675 (Feb. 27) 1909.

9. Dienes, Louis, and Mallory, T. B.: Histological Studies of Hypersensitive Reactions, Am. J. Path. **8:** 689 (Nov.) 1932.

abrasion or is introduced hypodermically within the layers of the skin. In the human body, where the time of exposure is quite accurately determined, it requires from three to seven weeks [10] for the tissues to become so sensitized as to give such a reaction.

There is nothing ordinarily taken into the human or animal body which causes sensitization of the tissues to tuberculoprotein except tubercle bacilli themselves which are resulting in or have resulted in tubercle formation.[11] It is possible to produce such sensitization artificially in the laboratory by the use of dead tubercle bacilli or the protein content of tubercle bacilli. However, this is usually of short duration because it is eliminated and not further produced, whereas that which develops through tubercle formation in the human body is usually thought to be of long duration because of continuous production from living bacilli. Since tubercle bacilli in tubercles and the lymph nodes of the primary complex often remain alive over long periods of time, they actually constitute manufacturing plants of tuberculoprotein in such quantities as to keep up the sensitization. Evidence has accrued to show that in some persons who are apparently well and who have previously reacted positively to the tuberculin test the sensitiveness of the tissues becomes so decreased that it is impossible to produce a reaction even with large doses of tuberculin. How frequently this occurs is not known. It is a possibility that the tubercle bacilli which result in the tubercles of first infection may be destroyed, after which there is no longer a source of tuberculoprotein in the body and the tissues completely lose their sensitiveness. It has long been known that in overwhelming acute tuberculous processes, such as pneumonia, meningitis and miliary disease, the tissues are often desensitized so that it is impossible to obtain a positive reaction from the tuberculin test except when large test doses are used. Again, in chronic forms of tuberculosis during the terminal stage there may be enough tuberculoprotein produced and liberated to desensitize the tissues. Occasionally one sees a person with chronic tuberculosis who is by no means in the terminal stage and yet the tissues fail to react to the tuberculin test. Apparently the number of such persons is small, and no one has made sufficiently long observations to determine whether in the same individuals there was at an earlier time definite sensitization of the tissues. It is probable that such cases may have become desensitized through the tuberculoprotein produced in their own bodies. These changes in human beings are not essentially different from those which the veterinarians observed in the nineties. Indeed, Bang [4] of Denmark, in writing of the disadvantages of tuberculin in the testing of cattle said:

> In the first place the violence of reaction has no constant relation to the development of the disease. Farmers often believe the cow reacting violently to be extremely tuberculous and the one reacting feebly to be comparatively sound. The case is rather the reverse, but this is not constant either. Next, tuberculin is not absolutely to be relied upon. To be sure you will very seldom be mistaken in the conclusion that a cow which has shown an evident reaction is indeed tuberculous. I, for my part, know only three or four cases in which I could find no tuberculous deposits in such an animal, and in these cases the fault may be mine and not that of tuberculin, as it is impossible to examine every part of the body of a slaughtered animal. The tubercles may have been hidden in an unusual place, or they may have been so small or so fresh that they could not be discovered. This case then is a very rare one, though the unskilled observer, for instance, the butcher, may believe it to be a frequent one. Moreover, it must be considered that it would not be a disaster even if a sound animal should for once be considered tuberculous. Far more frequent is the case that an animal which has not reacted is proved by slaughtering to suffer from tuberculosis. But usually this has not the practical importance one would suppose it to have, as in the great majority of cases the deposits in question are very small, very old or greatly calcified, indicating that the process has become stationary. Experience teaches that such small deposits usually keep quite unchanged for a series of years and may even at length be healed. In fact, animals which have this form of tuberculosis will be quite harmless to their associates as they do not excrete tubercle bacilli. But there are also cases in which an animal suffering from far advanced and very contagious tuberculosis does not react to tuberculin. This is a very provoking fact; luckily, however, it happens but seldom, and we must be taught by it not to rely on tuberculin alone but to have recourse to clinical examination which will usually enable us to detect tuberculosis in such advanced forms. In the third case, tuberculin has the imperfection that reiterated reactions will not rarely call forth a temporary insusceptibility to the substance so that tuberculous animals will at length cease reacting to a new injection. This circumstance may occasion fraud in dealing in cattle, but as the fact is very inconstant the imposture will by no means always be successful. . . . But the imperfections of tuberculin mentioned here are eclipsed by its good qualities. According to my experience, which is founded on a very great number of autopsies, it is in 10 per cent of the cases at most that tuberculin will be at fault and it is only in a very small percentage of these cases that the fault will be of consequence. Tuberculin, therefore, in spite of its imperfections, marks an immense advance in the diagnosis of tuberculosis. By its help we are able to discover a great number of cases of tuberculosis which were formerly absolutely concealed. Until something still better has been found, we must consider it to be our best weapon in the struggle against tuberculosis of cattle.

Thus those who believe that the finding of the occasional person with tuberculosis who does not react positively to tuberculin is a new discovery may be surprised to learn that this fact was known to the veterinarians forty years ago. Moreover, one may look on the occasional failure on the part of tuberculin as insignificant in a control program just as the veterinarian does.

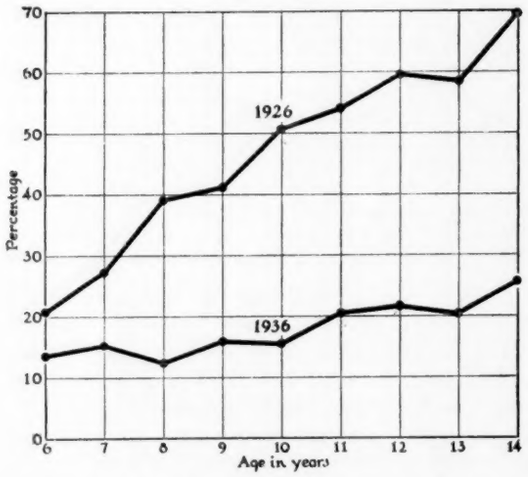
The tuberculin test is extremely valuable in determining who in a family or in a community has foci of tubercle bacilli in the body. A positive reaction is diagnostic of the first infection type (primary complex) somewhere in the body. This type rarely causes significant illness but is always the forerunner of reinfection destructive forms of disease, both acute and chronic, when this type develops. The tuberculin test, therefore, serves as a screen to select those who have been infected through direct or indirect exposure and who should be carefully examined and kept under close observation thereafter for the development of clinical disease.

During the months of April and May 1936, we tested 4,549 children in the schools in which testing had been done ten years ago. There has been a sharp decrease in the percentage of children reacting positively to the test, as shown in the accompanying chart, indicating that the environment of the present school children has been very much better so far as exposure to tubercle bacilli is concerned than was that of the children in the same age period ten years ago, when 47.33 per cent reacted positively. In the accompanying table the positive reactors have been grouped according to age. To expect another sharp decrease in the next ten years would not be illusory, provided the present program of preventing contact of children with open cases of tuberculosis can be continued and extended.

10. Wallgren, Arvid: Primary Pulmonary Tuberculosis in Childhood, Am. J. Dis. Child. **49**: 1105 (May) 1935.
11. Krause, A. K.: Human Resistance to Tuberculosis at Various Ages of Life: Appendix A, Remarks on Conditions Necessary to Arouse the Allergic State and on Immunity Through Fixation of Bacteria, Am. Rev. Tuberc. **11**: 303 (June) 1925.

In many parts of the country, the number of positive reactors among children and young adults is decreasing. In these places, programs similar to that employed in Minneapolis have been in effect so as to reduce definitely the number of communicable cases of tuberculosis through isolation, treatment and other measures, thus creating an environment for children with far fewer tubercle bacilli than that of former years. For example, in Detroit [12] in 1930, of 5,044 children examined, 54 per cent reacted positively while in 1935, of 5,504 children examined, 26 per cent reacted positively. While the rate of decrease in positive reactors apparently has been rapid, it should be accelerated, as the number of communicable cases of tuberculosis in any community is decreased through serious effort to locate and render their disease noncommunicable or to isolate them. Obviously, the lower the incidence of tuberculous infection in any community, the more valuable the tuberculin test; likewise, the problem of examining and keeping under close observation all the positive reactors becomes a physical possibility.

The tuberculin test is easily administered and the cost is small, but other phases of the examination, such as



Percentages of the children acting positively to the test in 1926 and 1936.

making of x-ray films, are more expensive. Therefore, with relatively small expense and in a short time through the tuberculin test, one can select those who need further examination. For example, if in a given community 15 per cent of the children and young adults react positively to the tuberculin test, one immediately eliminates the 85 per cent who at that time do not need any further examination for tuberculosis.

Some workers have found more positive reactions with old tuberculin, while others have reported more with purified protein derivative. The recent work of Plunkett [13] showed that when the larger doses of the two preparations are employed simultaneously at different sites on the same individuals there is essentially no difference in the percentage of positive reactors. The potency of old tuberculin from various drug houses varies considerably. This is a rather serious objection. The chief advantage of purified protein derivative is that it is standardized, so that its potency is the same wherever it is used. This, of course, insures more uniform results than when old tuberculin is used. The only objection to purified protein derivative is its high cost. In our present study we employed old tuberculin secured from the Saranac Laboratories, since this tuberculin had been used in our study of a decade ago.

The present method of administering the tuberculin test in two doses is objected to by many workers, since all who do not react to 0.01 mg. of old tuberculin or the first dose of purified protein derivative should have a second dose consisting of a full milligram. For example, if tests are to be made on 100,000 children in a community where only 10 per cent react positively to the first dose, 90,000 must be retested. In short, the expense and time of testing is nearly doubled. In our survey we employed an initial dose of 0.1 mg. and retested all the negative reactors with 1 mg. While each of us was able to administer from 300 to 500 tests in an hour, still much time could have been saved if a single test dose had been used. Many workers use 0.1 mg. of old tuberculin as the first and final dose; a few use a full milligram as the only test dose. Long [14] and his co-workers are about to present a single test dose of purified protein derivative, which should greatly facilitate tuberculin testing in this country.

Some physicians prefer other methods of administration than the intracutaneous, and also some persons object to the use of a hypodermic needle. For example, Chadwick, Pope and their co-workers use the epidermal method of Pirquet with excellent results. Slater,[15] by carefully administering tuberculin by the epidermal method on one arm and by the intracutaneous method of Mantoux on the other arm, finds a difference in positive reactions of only 1 per cent in favor of the intracutaneous method. However, in the hands of less experienced workers a larger discrepancy is usually reported. For those who even object to the scarification of the skin necessary for the epidermal test, a modification of the percutaneous test described by Lovett [16] and the tape test by Wolff [17] are valuable. Indeed these tests, when carefully administered, closely approximate in accuracy the intracutaneous test. However, their administration is slightly more time consuming.

The specificity of the tuberculin test has been demonstrated on such a large scale in animals that it can no longer be questioned. When Pearson and Cotton began using the tuberculin test to detect tuberculosis in cattle in 1891, they were convinced of its specificity. Although for the next two or three decades much opposition was voiced, those who were convinced of its specificity brought forth irrefutable evidence. For example, in some places 92 per cent of the cattle reacting positively to the test were found at postmortem examination to have macroscopic tuberculous lesions. In political divisions where tuberculin testing of the cattle herds was repeated periodically, the time arrived when less than 50 per cent of those reacting positively showed macroscopic lesions at postmortem examination. Another great controversy was initiated by the opponents of the tuberculin test on the ground that more than 50 per cent of the animals slaughtered did not show lesions and therefore did not have tuberculosis, whereupon the proponents called attention to the fact that tuberculous lesions begin their development in a microscopic way and that the test is so delicate that even such lesions are detected by it. They were simply catching up with tuberculosis; that is, they were diagnosing it before it could be seen with the naked eye. It was then their

12. Douglas, B. H.: Annual Report, 1935, Tuberculosis Service, Department of Health, Detroit, Michigan.
13. Plunkett, R. E., and Siegal, William: Comparative Study of O. T. and P. P. D., Nat. Tuberc. A. Tr., 1936.
14. Long, E. R.: Personal communication to the authors.
15. Slater, S. A., and Jordan, Kathleen: A Comparative Study of the Pirquet and Mantoux Tuberculin Tests in School Children, Am. Rev. Tuberc. **25**: 218 (Feb.) 1932.
16. Lovett, B. R.: The Percutaneous Tuberculin Reaction, Am. J. Dis. Child. **37**: 918 (May) 1929.
17. Wolff, Ernst: A Tape Test with Tuberculin Ointment, Am. Rev. Tuberc. **27**: 308 (March) 1933.

aim to reach the time when all tuberculosis among cattle would be diagnosed while the lesions were still microscopic and long before those animals with such lesions could spread their bacilli to others. They have now reached the ultimate goal; namely, complete eradication of tuberculosis from large numbers of herds and from all the herds in a few entire counties. All that remains is to use the same method that has led to this goal in the remaining parts of the country and tuberculosis will be completely eradicated from our animal herds. Indeed, by the close of the year 1937 all states will be accredited, with the possible exceptions of South Dakota and California. This is the greatest revelation of all time with regard to tuberculosis control, and it is one of the revelations of the tuberculin test. Without this specific test it would not have been possible to eradicate tuberculosis from the animal herds.

this disease passes through many phases and stages from the time the neutrophil phagocytoses the first tubercle bacillus until the disease takes the life of the individual. Unfortunately, it was not considered that a person had tuberculosis until he was ill, when in reality the disease had existed since the tubercle bacilli were first focalized by the neutrophils. About two years ago a committee of the Minnesota Trudeau Medical Society strongly recommended that all persons who react positively to tuberculin be reported to the health department. The society rejected the report and similar action has been taken against such committee reports in other states. However, in Minneapolis the commissioner of health strongly encourages physicians to report all positive tuberculin reactors even though the disease cannot be located by present methods of examination. Such reports are of great help to the health

Positive Reactors Grouped According to Age

Age	Sex	Number Tested	Positive 1:1,000	Negative 1:1,000 Positive 1:100	Positive 1:1,000 or 1:100	Total Number of Complete Tests	Total Number Positive
5	Male	31	4 (12.9)	1 (3.2)	5 (16.1)		
	Female	32	5 (12.5)	2 (6.3)	6 (18.8)	63	11 (17.5)
6	Male	137	5 (3.6)	11 (8.0)	16 (11.7)		
	Female	137	9 (6.6)	12 (8.0)	21 (15.3)	274	37 (13.5)
7	Male	233	15 (6.4)	15 (6.4)	30 (12.8)		
	Female	240	16 (6.7)	26 (10.8)	42 (17.5)	473	72 (15.2)
8	Male	251	16 (6.4)	15 (6.0)	21 (12.4)		
	Female	273	15 (5.5)	19 (7.0)	34 (12.5)	524	65 (12.4)
9	Male	288	23 (8.0)	29 (10.1)	52 (18.1)		
	Female	319	24 (7.5)	21 (6.6)	45 (14.1)	607	97 (16.0)
10	Male	300	16 (5.3)	28 (9.3)	44 (14.7)		
	Female	278	18 (6.5)	29 (10.4)	47 (16.9)	578	91 (15.7)
11	Male	303	35 (11.6)	39 (12.9)	74 (24.4)		
	Female	307	34 (11.1)	18 (5.9)	52 (16.9)	610	126 (20.7)
12	Male	284	25 (8.8)	33 (11.6)	58 (20.4)		
	Female	290	38 (13.1)	29 (10.0)	67 (23.1)	574	125 (21.8)
13	Male	276	21 (7.6)	32 (11.5)	53 (19.1)		
	Female	245	32 (13.1)	22 (9.0)	54 (22.0)	521	107 (20.5)
14	Male	136	19 (14.0)	16 (11.8)	35 (25.7)		
	Female	114	15 (13.2)	14 (12.3)	29 (25.4)	250	64 (25.6)
15	Male	35	6 (17.1)	4 (11.4)	10 (28.6)		
	Female	18	3 (16.7)	2 (11.1)	5 (27.8)	53	15 (28.3)
16	Male	13	0	1 (7.7)	1 (7.7)		
	Female	7	2 (28.6)	0	2 (28.6)	20	3 (15.0)
17	Male	0	0	0	0		
	Female	1	0	0	0	1	0
18	Male	0	0	0	0		
	Female	1	0	0	0	1	0
Total number tested...	Male	2,287	185 (8.1)	224 (9.8)	409 (17.9)		
	Female	2,262	210 (9.3)	194 (8.6)	404 (17.9)	4,549	813 (17.9)
		4,549	395 (8.7)	418 (9.2)	813 (17.9)		

The tuberculin test is no less specific for human beings than it is for cattle. Indeed, the veterinarian uses tuberculin made from the human type of tubercle bacilli for testing cattle just as we do for testing human beings.

Through the tuberculin test and slaughter of the positive reactors, the veterinarian quickly recognized a long latent stage in tuberculosis but did not complicate the situation by calling it infection rather than disease. The following quotation from the report of a committee headed by Dr. John R. Mohler [18] is significant: "When the tuberculin test is applied to cattle for any purpose it should be clearly understood that the reacting animals are to be regarded in every sense of the word as recognized cases of tuberculosis, which under an obligatory notification law must be reported at once to the proper authority." In human medicine, one must recognize the fact that a positive tuberculin reaction indicates the presence of tuberculosis somewhere in the body. For too long the fact has been overlooked that

18. Mohler, J. R.: Report of Committee on Location of Tuberculosis in Cattle, Appendix. Moore, Veranus: Bovine Tuberculosis and Its Control, Ithaca, N. Y., Carpenter & Co., 1913, p. 121.

officer, who is often able to assist the private physician in finding sources of exposure. A list of positive tuberculin reactors is also valuable because they are potential cases of clinical tuberculosis and should be examined periodically.

Although the reporting of persons who do not show any evidence of tuberculosis except the positive tuberculin reaction is strongly opposed at the present time, it must eventually be considered as an important part of a tuberculosis control program. Here again we are only recommending what the veterinarian has found so effective in eradicating tuberculosis from the cattle herds.

Through the tuberculin test and slaughter of the positive reactors, the veterinarian learned that, once tubercle bacilli gain lodgment in the animal's body, an actual or potentially serious condition exists. Of this Pearson and Ravenel [4] say:

> It is a disease that runs a chronic course with but little tendency to heal, although it is sometimes latent for a long period. Even if the animal recovers, it is not thereby rendered immune to another attack as is the case with hog cholera, anthrax, influenza and numerous other diseases. Therefore,

when tuberculosis is introduced into a herd it is not self limiting and its tendency is constantly to spread and with a degree of rapidity that depends largely upon the sanitary conditions to which the herd is subjected.

Again they say:

After gaining a foothold in the body and after one or more tubercles are formed, the bacteria may invade other regions by passing through tissue, by being distributed mechanically in cavities or in canals or by being transported in currents of lymph or in the blood.

Moore [18] says:

It is not known how long the lesions may lie dormant, but we have individuals where they sprang into activity after three and one-half years, and also a case where an apparently healed, calcified tubercle contained living virulent tubercle bacteria three years after the cow ceased to react.

In the human body one can no longer look lightly on the primary tuberculosis complex when its presence is indicated by the positive tuberculin reaction.

The next step in our present survey consisted of making x-ray films of the chests of the children who reacted positively to the tuberculin test. Although the fact is well established that the positive tuberculin reaction establishes the presence of a primary complex somewhere in the body, the lesions that constitute this complex usually are not of clinical significance except in a few cases for a brief period of time as allergy appears, when there may be an elevation of temperature. Subsequent to this period there are no clinical manifestations. The x-ray film of the chest fails to reveal the location of the primary complex in 75 per cent or more. Moreover, knowing the location of the complex is of no material assistance to the clinician.

We no longer recommend making x-ray films of the chests of children except for the detection of developing reinfection or the clinical type of tuberculous lesions. Since this type of lesion is found in the chests of children who are positive tuberculin reactors only once in 2,000 or 3,000 examinations, it is hardly worth while to make x-ray films of the chests of children, since there are other age periods in life when films reveal so much more evidence of clinical tuberculosis. For example, during the high school age period one may expect to find evidence of developing clinical disease in one in every 500 to 800 positive reactors. In the college age period a larger number of positive reactors is found to have developing or well established clinical disease, whereas in the twenties and thirties one may find a case of clinical tuberculosis in every 100 or 200 positive reactors.

The form of tuberculosis that causes illness, requires treatment and disseminates tubercle bacilli to other human beings is largely a disease of adult life. Our chief reason for making x-ray films of the chests of the positive reactors in this study was to obtain confirmatory evidence concerning the absence of clinical disease in the chests of children which we have previously observed in other groups.

Considerable controversy has arisen regarding the necessity for treating children who react positively to the tuberculin test whether or not the primary complex is located by further phases of the examination. However, sufficient evidence is now available to justify the statement that active treatment is not necessary for such children. They do just as well in their homes as they do in institutions, and they do just as well in school and other usual activities as they do lying in bed at home.[19] While children with the first infection type of tuberculosis in the inflammatory stage may occasionally have tubercle bacilli revealed in the gastric contents, they rarely cough or expectorate; therefore they are not public health menaces. Active treatment was not recommended for a single child found in this study to react positively to tuberculin, because our observation with all forms of treatment on similar groups of children over a period of fifteen years has conclusively proved that treatment is of no avail.

This does not mean that our survey was of no value, for finding the positive reactors gave us two very definite leads that are of great importance in the tuberculosis control program: First, we learned from each positive reaction that the child had been exposed to a communicable case of tuberculosis. While it is true that a visit to a neighbor or a distant relative may suffice to set up a focus of tuberculosis in the child's body, it is also true that some positive reactors are in close association with persons who have communicable tuberculosis which may never have been diagnosed. Therefore, one of the prime objects of this survey was to seek the source responsible for the disease in each of these children and to stop any further exposure by isolating or treating these persons. This is being done as fast as possible.

Second, close observation is important for every child who reacts positively to the tuberculin test as soon as young adult life is reached, since the fact has been well established that in a good many such children clinical disease develops during adult life. Indeed, in a group of children (average age about 8 years) reacting positively to the tuberculin test in 1921-1922, we have found that approximately 10 per cent have already developed clinical tuberculosis.[20] In other groups reacting positively in each succeeding year, corresponding percentages have developed a manifest reinfection type of lesion.

Therefore, all these children who have reached the period of adolescence and all others as soon as they approach this period should have annual x-ray examinations of their chests. In this age period and thereafter the x-ray film is indispensable in the tuberculosis control program. When reinfection or clinical pulmonary tuberculosis is found to be developing, treatment should be instituted at once, for this is the form of disease that causes most of the serious illness and death from tuberculosis. By such a program of observation, practically all children who develop clinical disease will have it detected before symptoms are present and before it has become communicable. This is the time when tuberculosis can be treated most successfully in a very short time, and usually treatment will prevent the individual from falling ill or from becoming a disseminator of tubercle bacilli. Here collapse therapy, particularly artificial pneumothorax, is the most effective form of treatment and often can be instituted and maintained on an ambulatory basis.[21] When such a program of breaking contact is carried to its logical conclusion, tuberculosis must rapidly disappear.

In the whole educational campaign against tuberculosis in recent years, nothing has been so valuable or so significant as bringing to the attention of the public the fact that this disease is contagious. Indeed, it was

19. Myers, J. A.; Harrington, F. E.; Stewart, C. A., and Wulff, Marjorie: First Infection Type Tuberculosis, Am. Rev. Tuberc. **32**: 631 (Dec.) 1935.

20. Myers, J. A., and Harrington, F. E.: The Effect of Initial Tuberculous Infection on Subsequent Tuberculous Lesions, J. A. M. A. **103**: 1530 (Nov. 17) 1934.

21. Myers, J. A.: Collapse Therapy and the Ambulatory Patient, J. Thoracic Surg. **3**: 175 (Dec.) 1933; Artificial Pneumothorax with Particular Reference to the Ambulatory Patient, ibid., to be published.

the veterinarians' early recognition of this fact that added much to the success of their work. Moore [18] says: "Tuberculosis has gradually grown into many herds of dairy cattle. It should be guided in such a way that it will grow out. The secret of accomplishing this is to prevent the spread of tubercle bacteria from the present infected cattle so that with the disappearance of the animals now infected this destructive disease will be no more." In our epidemiologic work we are practicing the veterinarian's method of finding cases of tuberculosis and breaking contact with others.

The Bang method of control provided that all calves from cows reacting positively to the tuberculin test should be removed immediately after birth and fed on milk that had been heated or milk from cows that did not react positively to the test. When these calves reached the age of about 4 months they were tested again and periodically thereafter. Throughout the remainder of their lives they were kept away from other animals reacting positively to the tuberculin test. This is essentially the same procedure that Grancher, Bernard, Hess and many others in more recent times have employed for infants. Where this procedure has been practiced even in a very incomplete manner there has been a sharp reduction in mortality, morbidity and the development of primary complexes from tuberculosis. In fact, Boynton [22] has pointed out that in the state of Minnesota the mortality from tuberculosis in infants decreased 88 per cent from 1916 to 1933.

We know all that is necessary in order to control tuberculosis in the human family, and the method now in use has been proved to be sound. If this method is employed everywhere no immunizing agent will be needed. In fact, to the present time no satisfactory immunizing agent has been developed. The veterinarians have made numerous attempts to immunize cattle against tuberculosis. As early as 1913, Moore [18] said:

> It is impossible in a work of this kind to enter into a discussion of the theories of immunity, but the fact that individuals who have suffered an attack of tuberculosis and have recovered at least temporarily are not protected against a subsequent attack or recurrence does not argue in favor of a protective vaccination. Success may be attained but at present there seems to be no method that can be recommended to the cattle owner for successfully vaccinating or immunizing his animals against tuberculosis.

Since Moore's statement, other attempts have been made, including such preparations as Calmette's vaccine, BCG. After sufficient trial, however, the veterinarians of America have not adopted BCG as a satisfactory method of prevention. They have had a better opportunity to observe the effects of BCG on cattle than we could ever hope to have on human beings. The veterinarian's experience and his record of success in controlling tuberculosis, which is the best of any group of workers of any time, should discourage every physician from administering BCG to children. Certainly a preparation that the veterinarian considers unsafe and ineffective for cattle should not be used in an experimental way on the children of the United States. To prove the efficaciousness of an immunizing agent for tuberculosis in the human body would require decades; in fact, before this can be proved, our present method should reduce the disease in the human family to one of minor importance.

22. Boynton, Ruth E.: The Declining Death Rate from Tuberculosis in Children: An Analysis of Tuberculosis Deaths in Minnesota from 1915 to 1932, J. A. M. A. **104**: 1875 (May 25) 1935.

NONDRAINAGE OF THE PERITONEAL CAVITY IN APPENDICEAL PERITONITIS

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Since Mikulicz [1] expressed the opinion that a gangrenous appendix may be removed and the peritoneal cavity closed without the introduction of a drain, attempts have been made by various surgeons throughout the world to use this method in certain cases. Although since then the subject of drainage or nondrainage of the peritoneal cavity in the presence of peritonitis has been extensively studied, there seems to be no uniform opinion regarding it. Some state that it is best to drain the infected abdominal cavity, while others believe that drainage prolongs hospitalization, promotes the development of ileus, favors the development of ventral hernia and of intestinal adhesions and is in general contraindicated.

Even the proponents of nondrainage are somewhat hazy with respect to indications and contraindications.

With the introduction of asepsis and the consequent popularization of surgical treatment in general, there gradually developed the idea that in the presence of peritonitis, now known to be most frequently the result of an extension of the inflammation to the peritoneum from the acutely inflamed appendix, best results could be obtained by removal of the focus of infection, be it a ruptured appendix, a ruptured cyst or a perforated bowel, and a consequent introduction of a drain, consisting of a rubber tube, sterile gauze, a Penrose drain and the like. The idea of drainage is based on the prevalent but erroneous belief that the absorption power of the peritoneum is, in comparison with other serous membranes, very great, and the mechanical release, through the drain, of the infectious substances is bound to speed up recovery and to facilitate healing. This, in brief, is the rationale of "draining."

Numerous objections can be given to refute this theory. Not going into an extensive discussion of the anatomy and physiology of the peritoneum, I may briefly state that the absorption of the peritoneum is not greater than that of any other serous membrane, that it occurs chiefly along the region lining the diaphragm, and that one must bear in mind that it is physically impossible to drain the entire peritoneal cavity by means of the usual type of drain employed for this purpose.

Poynter,[2] who made a thorough study of the problem of peritoneal absorption, came to the conclusion that drainage for peritonitis is illogical in that absorption has contaminated the general circulation long before any operative procedure can be instituted and that the process can be little, if at all, influenced by so-called surgical drainage.

It is a physical impossibility to drain the entire peritoneal cavity even by multiple incisions and drains. It can be proved experimentally that from twenty-four to forty-eight hours after the drain is introduced the intestinal loops or omentum are widely agglutinated around the drain and that the actual area of drainage corresponds roughly to that of the surface area of the drain itself.

1. Mikulicz, J.: Samml. klin. Vortr., 1885, No. 262.
2. Poynter, C. W. M.: Nebraska M. J. **14**: 362 (Sept.) 1929.

Miller,[3] who made a thorough study of the subject and also reviewed the literature, came to the conclusion that drainage increases postoperative discomfort, prolongs convalescence and is in many cases the cause of secondary operations.

Stanley Raw advocates closing the abdomen in all cases in which the appendix has been removed. He has employed this method since 1921 and finds that there is less suppuration without drainage than with it.

Banks favors nondrainage in all cases of spreading and diffuse peritonitis whenever it is possible to remove the cause.

Marchini [4] reported 301 cases of localized peritonitis; drainage was used in 184, with nine deaths; drainage was omitted in 117, with two deaths; there were 142 cases of diffuse peritonitis; drainage was used in 101, with thirty-one deaths; drainage was omitted in forty-one, with seven deaths. These figures show, therefore, that of the 158 patients with localized or diffuse peritonitis, without drainage, nine died, giving a mortality slightly less than 6 per cent, while of the 285 patients with drainage, forty died, giving a mortality of a little over 14 per cent.

Shipley [5] and Bailey, who recently made a study of the subject of treatment of appendicitis with peritonitis, came to the following conclusions:

1. Exclusive of strangulated hernia, peritonitis is the chief cause of intestinal obstruction.
2. In the majority of instances it is not the peritonitis per se that causes the adhesions and bands leading to obstruction, but the reaction of the peritoneum to the drain.
3. Drainage material, especially in the lower abdomen, often causes widespread adhesions between loops of intestine, mesentery, omentum, pelvic organs and abdominal wall.
4. Drains are soon sealed off and do not drain any considerable portion of the peritoneum.
5. Paralytic ileus seriously obscures the clinical picture when drains are left in the abdomen.
6. Pelvic drains increase the incidence of postoperative retention of urine.
7. Drained abdomens are most likely to develop troublesome, painful, or disabling late postoperative adhesions.
8. Late intestinal obstruction is more likely to occur in drained than in undrained abdomens.
9. None of these considerations should carry weight if the risk of life is increased by closure without drainage.
10. Evidence is accumulated that the introduction of drains into the abdomen in the treatment of early peritonitis may be dispensed with, without increase in the death rate.

In order to ascertain the opinion of the leading American surgeons regarding the question of drainage or nondrainage of the peritoneal cavity in appendiceal peritonitis, a number of questionnaires of the following type were sent to the leading surgeons and surgical clinics of America:

1. Do you use drainage of the peritoneal cavity in operative cases of appendiceal peritonitis as a routine measure?
2. If "yes," do you concede exceptions from this routine, and in which cases?
3. If "no," in which cases do you use drainage?
4. What do you consider the advantages of drainage, and what do you consider the disadvantages?
5. What do you consider as the advantages of nondrainage, and what are the disadvantages?
6. Remarks.

A study of the replies shows that the first question, "Do you use drainage of the peritoneal cavity in operative cases of appendiceal peritonitis as a routine measure," brought twenty-five clear-cut negative answers, seven definitely positive replies, and seven answers with reservations; i. e., the problem was discussed in general and reasons were given for "drainage" or "nondrainage" in certain cases. These replies are unusually significant in that they represent a cross section of the opinion of the leading surgeons of the country. We are dealing here, therefore, not with theoretical considerations but with actual realities. In each case the use of drainage or nondrainage is based on actual clinical results which dictate one or the other method of procedure.

As further seen from the replies to the questionnaire, the grounds given by the majority of surgeons for nondrainage are essentially as follows:

1. It is doubted whether drainage of the peritoneal cavity as a whole can actually be obtained, since any drainage is walled off within a few hours.
2. The drain acts as a foreign body, increases pain, prolongs convalescence, favors the development of postoperative ventral hernia and increases the incidence of postoperative intestinal obstruction, or mechanical ileus, by increasing the tendency to the development of bands and adhesions.
3. Nondrainage shortens convalescence, eliminates the possible reaction to a foreign body, decreases the tendency to postoperative intestinal obstruction or mechanical ileus, permits the peritoneum to attain a state of normality in a relatively shorter period of time, gives a better scar, since the wound heals as a rule by primary intention, and eliminates the possibility of fistula formation.

The grounds cited in favor of drainage are largely the following:

1. It removes tension and permits an avenue of escape for the pus and necrotic tissue that may be present. The removal of these substances is advantageous because it is known that they serve as excellent culture mediums for the pathogenic organism responsible for the infection, and indirectly maintain the infection.
2. It prevents a generalization of the process in cases of a walled-off abscess and minimizes absorption of infected material.
3. The walled-off pocket may be reached through the wound without its being reopened.
4. It decompresses abscess cavities and permits healing from the bottom.
5. It exteriorizes or walls off a damaged area from the general peritoneal cavity.
6. It is a necessity for taking care of leakage from a hollow viscus and to provide an exit for pus produced by tissue which has none of the specific qualities for limiting and combating an infection.
7. It maintains the patency of the opening in the abdominal wall during the time the processes of healing are obliterating the abscess cavity; it likewise establishes a tract along which a fecal fistula may drain in case the wall of the cecum is infected and in case of inadequate closure of the appendiceal stump.

Some of the answers indicate that in many instances drainage is used too often, that one still follows the dictum "when in doubt, drain." It cannot be denied that in some instances the logical method of procedure is to drain. I have reference to the cases in which, because for some reason the focus of infection cannot be removed, when one deals with a walled-off abscess or when necrotic or suppurative tissue is left in the abdo-

3. Miller, H. C.: Nebraska M. J. **15**: 401 (Oct.) 1930.
4. Marchini, F.: Arch. ital. di. chir. **28**: 549, 1931.
5. Shipley, A. M.: South. Surgeon **3**: 308 (Dec.) 1934.

men. Illogical, however, is the "routine" drainage of the peritoneal cavity in every case of appendiceal peritonitis. Management of this type is unquestionably responsible for many unnecessary deaths due to appendiceal peritonitis. Many surgeons have correctly stated in their answers that "blanket rules cannot be given and that the judgment of the surgeon in each case must determine the indications or contraindications to drainage."

Trinca,[6] in his recent communication based on an analysis of 244 cases of diffuse peritonitis treated without drainage, comes to the following conclusions:

1. Owing to the nature and distribution of the contents of the peritoneal cavity, it is physically impossible to effect adequate drainage in cases of diffuse peritonitis.

2. Attempted drainage is not necessary when the primary focus has been adequately dealt with.

3. In the majority of cases it is unnecessary to remove the peritoneal exudate in the operative treatment of peritonitis.

4. The low mortality obtained in a series of 244 cases of diffuse peritonitis indicates that peritonitis in the early stages is not a serious condition if treated on rational lines.

5. The drainage tube should be abolished whenever possible in the operative treatment of peritonitis.

One must remember that the peritoneum is, as a rule, capable of coping adequately and successfully with an infection. This can be facilitated by the surgeon when the original focus of infection is removed, whether it is a ruptured viscus or a gangrenous appendix. If the general condition of the patient is satisfactory, this measure alone, plus adequate administration of fluids in the form of saline solution, dextrose, blood, and cardiac stimulants, if necessary, would eventually permit an uneventful recovery.

In cases in which the infection is produced by one or more very virulent organisms, the drainage is of more than questionable value because the infection has spread throughout the body, through the lymph and circulatory systems, long before the surgical treatment has been instituted. If the infection is less severe, the introduced tube fails of its purpose of drainage, since the entire peritoneal cavity cannot be drained, and actually increases the danger to the patient by serving as a foreign body, predisposing to the formation of adhesions and consequently to mechanical ileus, and, even under the most favorable conditions, prolongs, hospitalization, adds to the discomfort of the patient and interferes with the formation of a strong healthy scar.

CONCLUSIONS

In the course of the last few years I have treated about twenty-five cases of appendiceal peritonitis along the lines mentioned; namely, I have simply eliminated the focus of infection and closed the abdomen, introducing a rubber tissue drain down only to the closed peritoneum; the results obtained were so encouraging that I believe I am justified in drawing the following conclusions:

1. Drainage of appendiceal peritonitis is indicated:

(*a*) In cases in which the primary focus of infection cannot be removed.

(*b*) In cases in which a large amount of necrotic and contaminated tissue is left in the abdominal cavity.

(*c*) In cases of walled-off abscess.

2. In all other cases of appendiceal peritonitis, drainage is definitely contraindicated.

3. The advantages of nondrainage are:

(*a*) There is less morbidity and less mortality.

(*b*) It minimizes the possibility of postoperative mechanical ileus.

(*c*) It shortens the duration of illness.

(*d*) It minimizes the tendency of postoperative hernia.

(*e*) It excludes the possibility of development of a fistula.

(*f*) It minimizes the tendency of postoperative adhesions.

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6. Trinca, A. J.: M. J. Australia **2**: 465 (Oct. 7) 1933.

THE SKIN REACTIONS OF INFANTS AND CHILDREN TO SOAPS

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Surprisingly little is known at the present time of the actual mechanism of the action of soap on the skin. It is obvious that accurate knowledge of such a commonly used material would be of great practical value. Increasing interest in contact dermatitis has brought forth many questions about the rôle of soaps in the development of this condition. There is a vast amount of misinformation available chiefly through the all too powerful medium of propaganda advertising.

Clinical analyses of soap reactions are being made at the present time, chiefly through dermatologists. This is done by means of the patch test, controlled carefully. In 1928 Hazen [1] found eight cases of allergic dermatitis due to soap in a series of 127 patients. In his detailed studies of the patch test in 1931 Stauffer [2] mentioned soaps and asserted that most of the eczematoid reactions to patch tests with soap solutions occurred in the eczema (contact dermatitis) patient. He did not believe that the alkali content of the soap caused the skin reactions. On the other hand, in his review of soaps, Mayer [3] stated that soap hypersensitivity was really an alkali hypersensitivity. Osborne and his associates [4] have studied the eczematizing properties of soaps in greater detail. They examined 115 patients and found also that many more reactions were evident in the patient with dermatitis. As with the interpretation of the reactions of so many commercial products today, they said "it is obvious that it is impossible to determine the exact eczematizing substances in any given soap unless a complete list of the ingredients used in its manufacture is available." They believed, however, that "the fatty acid formed on hydrolytic dissociation together with many miscellaneous ingredients of soaps, most of which are known eczematizing agents, seem to us the most likely etiologic factors in the production of eczema due to soaps." In a series of seventeen nonselected cases of contact dermatitis, I [5] found that pure

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1. Hazen, H. H.: Allergic Dermatoses, Arch. Dermat. & Syph. **18**: 121 (July) 1928.
2. Stauffer, Hans: Die Ekzemproben (Methodik und Ergebnisse), Arch. f. Dermat. u. Syph. **162**: 517, 1931.
3. Mayer, R. L.: Toxicodermien, in Handbuch der Haut- und Geschlechtskrankheiten, Berlin, Julius Springer, 1933, IV/2.
4. Jordon, J. W.; Walker, H. L., and Osborne, E. D.: Studies in the Eczematizing Properties of Soap, New York State J. Med. **36**: 791 (May 15) 1936.
5. Goldman, Leon: Patch Tests with Soaps, M. Bull. Univ. Cincinnati **7**: 90 (Nov.) 1935.

coconut oil soaps had a greater frequency of reaction than other types of soap, including the soaps with a weaker concentration of coconut oil. In five of my cases, soap was a possible etiologic factor. I suggested that sometimes soap may account for a relapse in contact dermatitis when the supposed causative agent had been removed. In his list of materials that commonly induce cosmetic dermatitis, Balyeat [6] mentioned alkali, mercuric iodide and saponated solution of cresol as being responsible for skin reaction from soap. He listed also those toliet soaps which he found irritating to the skin.

Recently Hansen [7] has studied the question of soap reactions on the skin. He has determined the time

TABLE 1.—*Intensities of the Skin Reactions in Children to 10 per Cent Soap Solutions*

	Degree of Reaction						
Soaps	0	1-A*	1-B*	1-C*	1-2	2	2-3
1	5	2	2	3	1	0	0
2	6	6	6	1	0	0	0
3	9	1	4	1	0	0	0
4	7	7	5	5	0	0	2
5	6	3	2	0	0	0	0
6	7	12	4	4	1	1	0

* Arbitrary classification of the degrees of the erythema-edema reaction.

interval for the return of the usual p_H in an area washed with various types of soap. The strong alkaline soaps, of course, required the longest period. He obtained no positive patch tests in his series to 10 per cent sodium stearate, 10 per cent sodium palmitate and 10 per cent sodium oleate. No significant reactions were obtained with tenth normal sodium hydroxide. In 8 per cent of his cases of eczema (contact dermatitis) he obtained vesicular patch test reactions to sapo kalinus (linseed oil, potassium hydroxide and coconut oil). He believed there was no true hypersensitivity to soap, the soap test being a nonspecific reaction. The injurious action of soaps (keratin layer) can be reduced to a minimum, Hansen said, by using a "truly good soap." Bonnevie [8] too, from a study of some 800 patients with contact dermatitis, concluded that hypersensitivity, in the broadest sense of the term, to soap is very rare, less than 0.3 per cent of cases. In most of the cases of positive soap reactions, the offending agent was some material incorporated in the soap, as benzaldehyde, terpenes, tar and sodium perborate. Sodium perborate (Persil soap) was the commonest eczematogenic agent. There is no doubt, then, that the patient with a contact dermatitis reacts more frequently to soap than the person with a normal skin. This, as I [5] have pointed out, is a very important practical point. Moreover, soap itself does not produce this positive patch test reaction but chiefly the materials incorporated in it.

To study more closely the reactions of soap on normal skins, it was decided to do this in children. A study of 129 cases was made. The children were all white, with normal skins, and no history, either personal or familial, of any type of skin hypersensitivity or of hay fever or asthma. The children were studied through the courtesy of the obstetric and pediatric services of the Cincinnati General Hospital. The subjects were all observed during their entire hospital stay. This work reported is a preliminary survey and includes observations of the skin reactions to the patch test and to swabbings with soap solutions.

It seems necessary to review the technic of the controlled patch test. Jordon, Walker and Osborne say that "patch tests properly performed and interpreted should be a great aid in the diagnosis of soap eczema." If work on soap is to be standardized, exact details must be followed in the performance of the patch test. Our present-day technic of this test is the result of years of observation by able investigators since the days of the great pioneer work of Jadassohn [9] and Bloch.[9] There is some definite disagreement of that important property of the patch test, the concentration of the solution. In his tables, Mayer [10] mentions the use of small bits of moistened soap particles and insists that the control reactions must be known for each type of soap used. Blumenthal and Jaffe [11] gave as soap tests 5 per cent soap in hydrous wool fat or 2.5 per cent in 70 per cent alcohol. Osborne and his associates [4] have used soap solutions in dilutions of 1:100 and 1:400. In my work with soap over the past three years I have employed small bits of soap, 10 per cent solutions and 5 per cent solutions. Apparently, then, if one knows the reaction of soaps on the normal skin, the same concentration of soap may be used for testing the hypersensitive skin. Though there is some disagreement as to the concentration of soap solutions used, there is no disagreement on the time period of observation, from twenty-four to forty-eight hours. If the patch test is to be used to study skin reactions, the material must be kept on at least twenty-four hours. This is very important, especially if one wishes to observe the milder changes produced by soaps. At various times we have tried shorter periods of contact but they were not at all satisfactory. In our study with the children, those children who pulled off their own patch tests before the necessary time interval usually showed no reactions. When the same soap tests are done repeatedly, more agreement is found when the materials remain in contact with the skin for from twenty-four to forty-eight hours. The location of the patch test is also of importance if one wishes to control the milder reactions of soap. When the patch test is done on areas in which there is a considerable amount of pressure and friction, an erythema reaction is made more severe. For the true idiosyncrasy to soaps the vesicular patch test reaction may be obtained on the back. For our purposes of study, the soap solutions were done, as a rule, on the flexor surfaces of the arm and forearm. It is important that the soap solution be in intimate contact with the skin. The adhesive patch usually accomplishes this result. In the infant skin, especially the new-born

TABLE 2.—*Reactions to 5 per Cent Soap Solutions*

	Degree of Reaction						
Soaps	0	1-A	1-B	1-C	1-2	2	2-3
1	4	5	1	0	0	0	0
2	6	4	0	0	0	0	0
3	7	3	0	0	0	0	0
4	4	3	1	1	1	0	0
5	6	3	0	0	0	0	0
6	9	1	0	0	0	0	0
7	9	1	0	0	0	0	0

6. Balyeat, R. M.: Cosmetic Dermatitis, Northwest. M. J. **34**: 12 (Jan.) 1935.
7. Hansen, Preben: Einige Untersuchungen über die Einwirkung der Seife auf die Haut, Proc. Ninth Meet. Northern Dermat. Soc., Helsingfors, Mercators Tryckeri, 1936, p. 589.
8. Bonnevie, Poul: Personal communications to the author and discussion of Preben Hansen.
9. Cited by Stauffer.[3]
10. Mayer, Rudolph: Das Gewerbeekzem, Berlin, Julius Springer, 1930.
11. Blumenthal, Franz, and Jaffe, Kathe: Ekzem und Idiosynkrasie, quoted by Preben Hansen.

infant, the adhesive irritation was fairly severe and the following technic was adopted: The soap solutions were put on a small piece of white washed cotton cloth, covered with a very large cellophane disk, and this combination was then bandaged completely with an extensive bandage. In this way the soap solutions remained on the same area for the period of observation and there was no irritation of the adjacent skin. It is important to repeat these well known details of the technic of the patch test because any significant deviation from them will give rise to faulty conclusions.

The intensity of the reactions was read according to the method of Bloch.[9] In addition, an attempt was made to grade the degree of the erythema reaction. Unless the details referred to are adhered to closely, the examination of the erythema reaction is entirely valueless. For practical purposes, of course, the more severe reactions are the most important, the 2-3 reaction and beyond that. In this connection one must distinguish between two types of reaction, the toxic reaction type and the eczematoid reaction type.[12] The patient with contact dermatitis gives the eczematoid reaction. With the soaps and especially with their actions on normal skins, one is concerned with milder degrees of the toxic reaction type, chiefly redness and edema.

To simulate more closely the action of soap on the skin, a series of swabbings was done on a selected area. This area, on the mesial aspect of the arm, was swabbed fairly vigorously with a large cotton applicator dipped in the soap solution. The material was allowed to dry and nothing was put over the skin.

The soaps used in these experiments were seven common toilet soaps, which were purchased in the open market. The study is separated into two groups: the first, infants and older children and the second, the new-born. Five children were tested simultaneously with small bits of soap chips and the 10 per cent soap solutions. The intensity of the reaction was approximately the same. In one of the cases the 10 per cent solution gave a slightly stronger reaction than the bits of soap. To determine the influence of the time factor in the performance of the patch tests, five cases were tested with patch tests left on from several minutes to ten hours. The skin showed no reaction in any of these cases and the skin remained negative for a week afterward. Twenty-nine cases were tested to 10 per cent soap solutions.

From table 1 it is seen that the severe reactions were uncommon in this group of 113 tests on twenty-nine patients. There is also little difference between the various soaps used with the exception of soap 4 (a toilet soap containing cresol). Moreover, two patients showed a papulovesicular reaction to this soap. This agrees with the observation of Balyeat.[6]

Table 2, with sixty-nine tests on a smaller group of children (ten), shows about the same grouping of reactions. These tests were not made on the same children as the 10 per cent solutions.

Histologic studies of the mild soap reactions (toxic) were done. These were made of the reddish brown discoloration that follows removal of the patch test after forty-eight hours. At this time the skin is edematous and reddish brown, and the surface is furrowed with parallel fine linear markings. After a few days, branny desquamation occurs. Microscopic studies of the forty-eight hour stage showed wide separation of the lamellae and areas of fragmentation of the stratum corneum. The stratum granulosum was thin but otherwise not abnormal. No parakeratosis was noted. No other appreciable changes were seen in the epidermis until the basal layer. Here the cells showed vacuolization, distortion, pyknotic nuclei and loss of pigment. There were scattered areas of lymphocytic infiltrate in the upper layers of the derma, with no definite relationship to blood vessels. No appreciable edema of the papilla was made out. No apparent changes in the skin appendages were observed. Detailed microscopic studies, especially of the fat changes of the skin, are being done now. No microscopic studies were made of the vesicular reaction to the patch test, the true eczematoid reaction of hypersensitivity.

Soap swabbings were done in the older children group with 10 per cent soap solutions. Only two soaps were tested in four cases. No changes were observed in the skin after swabbing from two days to eight days.

Eighty-two new-born infants were observed. The patch test was done by means of the patch test bandage on the upper arm. The tests were left on for twenty-four and forty-eight hours. Twenty-one cases were examined by the patch test method and sixty-one by the soap swabbings. These infants were observed daily for a period of one week. It is important to note that immediately after delivery the child was rubbed every day with an antiseptic oil. No other materials were used on the child's body. In a few cases the patch tests were done a few minutes after birth and in these infants the vernix was merely rubbed away and the patch test applied directly to the skin. After the patch test bandages were removed the test sites were included in the general rubbing of the body with the antiseptic oil. Four different soaps were studied by the patch test method on the twenty-one new-born infants. Only nine reactions were observed. The reaction consisted of a faint, reddish brown area, which in several days showed pin-point desquamation. This change occurred usually from twenty-four to forty-eight hours after the patch test was removed from the skin. Of four soaps studied, one, soap 5, gave most of the reactions.

TABLE 3.—*Skin Reactions in the New-Born to 10 per Cent Soap Solutions*

	Degree of Reaction						
Soaps	0	1-A	1-B	1-C	1-2	2	2-3
1	5	2	0	0	0	0	0
2	1	3	0	0	0	0	0
5	8	3	0	1	1	0	0
6	18	6	0	0	0	0	0

There is only a slight difference in reactions of the soaps, 5 being perhaps slightly stronger. The difference, however, is not very significant. It is rather interesting to note how few definite reactions were observed in these forty-eight tests on twenty-one infants.

Soap swabbings were done on the remainder of the new-born group, sixty-one new-born infants. Separate swabs were used on each patient and the material was rubbed in rather vigorously over the mesial aspect of the entire arm. These areas had been oiled some three and one-half to four and one-half hours before the swabbing. The swabbings were repeated daily for seven days. No skin reactions of any sort were noted by this method. Four soaps also had been studied in this group (1, 4, 6 and 7). Icterus and the "milk rash" had no effect on the reactions to soap.

12. Miescher, G.: Zur Frage der Spezität der ekzematösen Hautreaktion, Arch. f. Dermat. u. Syph. **173**: 119 (Oct. 18) 1935.

Apparently it was not the preliminary oil rub of the skin of the new-born that caused the difference in skin reactions between the new-born and the older children, because a group of older children were taken and the oil was rubbed on from three and a quarter to four hours before the patch tests were made; also immediately before the patch test and also simultaneously with the patch test. These various methods did not seem to reduce the intensity of the reaction to the patch test with soap. This series, however, included only eighteen older children. Moreover, as has already been noted, Blumenthal and Jaffe [11] advised 5 per cent soap solution in hydrous wool fat. Additional studies are being made at the present time to determine this difference in reaction between new-born infants and the older children.

In eleven patients, four new-born and seven children, the alkali neutralization curves with phenolphthalein and bromthymol blue after the method of Burckhardt [13] were done. The testing was done both on areas previously swabbed with soap and on normal skin. The results were so variable that no definite conclusions could be drawn from the few cases examined. It appears that many extrinsic factors seemed to influence the test. These tests are being repeated at the present time using the newer method of Burckhardt with a 1 : 2,000 sodium hydroxide and 1 : 2,000 phenolphthalein solution.

Following the observations of Burckhardt,[14] it seems that the question of soaps relative to the production of contact dermatitis by other materials is indeed an important problem. He found that the skin could be sensitized to nickel by the single application of nickel sulfate on the skin previously damaged by alkali or a strong alkali soap (schmierseife). The mechanism is certainly not known. The following reasons have been suggested: changes in keratin which allow for the passage of antigens into the skin, the mechanical removal of the upper superficial layers of the skin, the partial disappearance of the protective fat layer from the skin, and the changes in the buffer action of the skin. Before these complex problems are studied, it seems more advisable to know the workings of soaps on normal skin.

CONCLUSIONS

It is generally agreed at present that patients with a contact dermatitis react more frequently to soap than patients with a normal skin. The eczematoid (vesicular) soap patch test is uncommon. Substances incorporated in soaps are supposed to be the more important eczematogenic agents.

A study was made of the skin reactions of seven common toilet soaps on 127 children, including eighty-two new-born. The methods included patch testing and soap solution swabbings. No changes were observed grossly after repeated soap swabbings. Exacting details of the patch test technic must be kept; otherwise the interpretation of the mild (toxic) patch test reaction is valueless. The new-born infants reacted much less frequently to the patch test than the older infants and children. The differences between the patch test reactions of the various soaps were not marked save for an increased intensity of reaction with a soap containing cresol.

13. Burckhardt, W.: Die Rolle des Alkali in der Pathogenese des Ekzems, speziell des Gewerbeekzems, Arch. f. Dermat. u. Syph. **173:** 155 (Oct. 18) 1935.

14. Burckhardt, W.: Die Rolle der Alkalischädigung der Haut bei der experimentellen Sensibiliserung gegen Nickel, Arch. f. Dermat. u. Syph. **173:** 262 (Nov. 18) 1935.

PROTAMINE INSULIN VERSUS ORDINARY INSULIN

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Hagedorn and his co-workers [1] have prepared from the sperm of a trout (Salmo iridius) the substance protamine, which, properly buffered, combines with insulin to form the compound protamine insulinate or, for want of a less confusing name, "protamine insulin." When this compound, which is sparingly soluble in the tissue fluid, is given hypodermically, it slowly breaks down so that the active insulin is gradually released and absorbed, thereby causing a continuous and prolonged action on the blood sugar.

It has been reported that occasionally the final effectiveness of protamine is delayed beyond the day of its administration as late as four or five days.[2] The duration of this prolonged absorption appears to approach nature's method of continuous insulin secretion. The Hagedorn investigators, basing their conclusions on a carefully treated group of diabetic patients, have shown these encouraging results with protamine insulin: a more prolonged insulin action without increasing the number of injections, diminished blood sugar fluctuations, and reduction of the risk of developing marked hypoglycemia reactions. They have found that the effect on the blood sugar is less rapid but more persistent than with ordinary insulin, so that normal blood sugar may be attained even in some cases of severe diabetes. Such results have been confirmed by Root and his co-workers,[3] Conlin,[4] Best, Kerr, Campbell and Fletcher,[5] and Sprague and his co-workers.[2]

What studies have been given to the action of protamine insulin on the absorption of the dextrose of the food appear to have been made for the purpose of rearranging the carbohydrate content of the day's allowance so as more nearly to meet the rate of absorption of the protamine compound. Thus Hagedorn's patients were given diets averaging a total of 2,300 calories, containing about 70 Gm. of protein and 100 Gm. of carbohydrate. By giving protamine insulin in the evening, better results were obtained, the diet being divided so that 40 per cent of the carbohydrate portion was taken at breakfast, 40 per cent at lunch and 20 per cent at dinner. Sprague obtained better results by providing diets containing from 160 to 170 Gm. of carbohydrate, apportioned approximately 20 per cent, 40 per cent and 40 per cent, because the slow development of the maximal effectiveness of protamine insulin when given before breakfast makes that division desirable. Root,[3] advocating higher carbohydrate diets, from 130 to 241 Gm., also obtained better results by rearranging the diets so

Miss Mary McNulty, B.S., was chief dietitian under whom the diets were prepared. Drs. Philip Duca and Albert Schwartz gave valuable assistance in carrying out the details of the experiment, Frank Casciato and Miss Marian Hanahan performed laboratory examinations.

Dr. F. B. Peck of Eli Lilly & Co. and Drs. H. Sidney Newcomer and J. A. Morrell of E. R. Squibb & Sons placed at the disposition of the author sufficient quantities of protamine insulin to enable him to undertake and complete the experiments, as well as to maintain an increasing number of patients on the combined insulin therapy.

1. Hagedorn, H. C.; Jensen, B.; Krarup, N. B., and Wodstrup, I.: Protamine Insulinate, J. A. M. A. **106:** 177 (Jan. 18) 1936.

2. Sprague, R. G.; Blum, B. B.; Osterberg, A. E.; Kepler, E. J., and Wilder, R. M.: Clinical Observations with Insulin Protamine Compound, J. A. M. A. **106:** 1701 (May 16) 1936.

3. Root, H. F.; White, Priscilla; Marble, Alexander, and Stotz, E. H.: Clinical Experience with Protamine Insulinate, J. A. M. A. **106:** 180 (Jan. 18) 1936.

4. Conlin, Frank: Protamine Insulinate, Nebraska M. J. **21:** 165 (May) 1936.

5. Best, C. H.; Kerr, R. B.; Campbell, W. R., and Fletcher, A. A.: Protamine Insulin, Canad. M. A. J. **34:** 400-401 (April) 1936.

that larger portions of carbohydrate were given for breakfast and lunch and smaller for supper, as in Hagedorn's method.

In spite of the fact that the slow absorption of protamine insulin causes a delayed action, and ordinary insulin, more rapidly absorbed, has immediate effects, the various investigators contend that both types of insulin should be given before meals, irrespective of the rate of absorption of the dextrose of the food or type of diet. They advocate that protamine compound be given from sixty to ninety minutes before meals,[3] thereby allowing more time for it to act on the fasting blood sugar, while the ordinary insulin be given from fifteen to twenty minutes before meals also.

POWER OF OXIDIZING THE DEXTROSE OF THE MEAL

Confronted by the fact that protamine insulin is slow acting, I decided to study (1) its effect on the fasting blood sugar during the interval between the time of its injection and the eating of the meal; (2) its rate of action on the increased blood sugar throughout the period of absorption of the dextrose of the meal; (3) its effect on the blood sugar at the end of the absorption of the meal, usually at the end of from three to four hours, the average time required for emptying the stomach;[6] (4) the resultant blood sugar level just prior to the succeeding meal; (5) the effect of absorption of the dextrose of the succeeding meal on this resultant blood sugar level at the end of the first hour after eating; (6) the effect of protamine insulin on the blood sugar during the interval between the patient's retiring and rising (i. e., midnight to 7 a. m., or the resting interval); (7) the result of the foregoing observations as compared with another group of diabetic patients to whom ordinary insulin was administered under analogous conditions; (8) the optimum time to administer protamine insulin in relation to the absorption of the dextrose; (9) whether it should be given alone or as an aid to ordinary insulin, and (10) the most effective clinical application of my observations. As a control, I also examined diabetic patients to whom no form of insulin had been administered.

In order to make these observations, eleven blood sugar estimations for each patient were taken in both the protamine insulin group (four patients) and the ordinary insulin group (four patients) during the meal period. The specimens of blood were obtained from the vein and examined for dextrose according to the Folin-Wu method. Thus for the protamine group a fasting blood specimen was obtained followed immediately by hypodermic injection of a designated number of units of protamine insulin; one-half hour later another blood specimen was taken, followed immediately by breakfast; again a blood specimen immediately on completion of the breakfast, then every half hour for two hours, and every hour for two hours; then lunch was given, which contained the same proportions of protein, fat and carbohydrate as the breakfast. Immediately on completion of lunch a blood specimen was obtained for sugar estimation followed again by another in an hour. Protamine insulin, being a slower acting compound, was given one-half hour before breakfast to the group under study. The doses of protamine insulin given varied from 20 to 60 units at each injection.

The ordinary insulin group (four patients) was also given a total of eleven blood sugar estimations. Thus a fasting blood specimen was obtained in each of the four patients in the group followed by a calculated and carefully weighed breakfast; another blood specimen was obtained immediately on completion of breakfast and again in from fifteen to twenty minutes, followed immediately by the designated dose of ordinary insulin. A blood specimen was obtained for sugar estimation in from fifteen to twenty minutes, then every half hour for one and one-half hours, and again every hour for two hours. Lunch was then served, followed immediately on its completion by the obtaining of another specimen of blood, and again in an hour. This group was given ordinary insulin from fifteen to twenty minutes after meals[7]—not before—as had been our practice with all diabetic patients requiring insulin who came to our diabetic dispensary or ward. Doses given to each member of the group varied from 16 to 60 units.

TABLE 1.—*Protamine Insulin Group (Meal Period)*

									Blood Sugar									
									Breakfast								Lunch	
Patient	Sex	Age	Weight	Duration of Disease	Complications Present	Previously Treated by Diet, Insulin	Fasting Blood Sugar	Protamine Insulin Dose	Before	After	½ Hr.	½ Hr.	½ Hr.	½ Hr.	1 Hr.	1 Hr.	Immediately After	1 Hr. Later
C. C.	♀	54	161	6 yrs.	None	Both	200	50	188	234	279	286	234	224	204	166	200	234
M. M.	♀	50	189	10 yrs.	Cataracts	Both	214	60	212	209	311	278	270	237	222	212	200	234
C. L.	♀	60	150	14 yrs.	Cataracts	Both	207	40	193	190	290	294	286	286	240	205	208	279
A. L.	♂	67	137	7 yrs.	None	Both	134	20	130	168	210	248	238	200	178	150	158	184

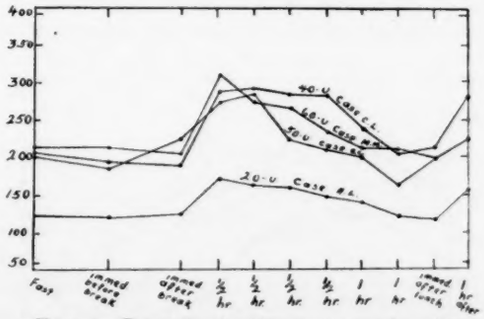

Chart 1.—Protamine insulin group (meal period).

The diets contained all the essential nutrients present in natural foods. We prescribed higher carbohydrate diets, varying from 100 to 180 Gm., proteins from 60 to 80 Gm. and fats from 80 to 100 Gm. for the total day. The quantities were divided into three equal portions so as not to vary from the established habits of the patients: breakfast containing one third of the day's total allowance of protein, fat and carbohydrate, and lunch one third. None of the patients had suffered previously from such gastro-intestinal disturbances as might interfere with the proper absorption of the food.

6. Rehfuss, M. E.: Proteins versus the Carbohydrates: An Inquiry into Their Gastric Digestion, J. A. M. A. **103**: 1600 (Nov. 24) 1934.

7. Sindoni, Anthony, Jr.: Optimum Time to Administer Insulin, Arch. Int. Med. **57**: 949 (May) 1936.

During these examinations the patients were well occupied and showed no mental disturbance. The patients who had been treated by insulin previously to our studies were made to discontinue the therapy for three days before we examined them. Both forms of insulin were given for breakfast; neither was given for lunch. All the patients under examination were from the diabetic clinic and ward of the St. Agnes Hospital.

For clarification we tabulated each group. In the experiments outlined in table 1 we found that when protamine was given before breakfast at the end of the first half hour interval there was a very slight decrease in the fasting blood sugar as compared with the original fasting level. This was found to occur in all four cases. This is probably due to the little absorption of the insulin of the protamine compound and clearly indicates its slow absorption and action. Immediately on completion of the breakfast the blood sugar was slightly increased in two cases and slightly decreased in the other two, as compared with the blood sugar at the end of the one-half hour fasting interval when protamine insulin was given. But in the next half hour, and for three hours, the blood sugar of all the patients in the protamine insulin group rapidly increased above the original fasting level to a new high peak, after which it began to decrease at the end of the absorption. This is graphically illustrated in chart 1.

It appears from these observations that the height or level of the blood sugar and its persistence following the absorption of the carbohydrate of the meal depends in all probability on the amount and rate of absorption of carbohydrate as well as on the exogenous or artificial insulin, the degree of damage to the insulin-secreting mechanism (the islands of Langerhans) and the state of liver function (eliminating any gastro-intestinal disturbance that might interfere with its digestion or absorption). The protamine insulin compound with the endogenous insulin was still insufficient to oxidize the rapidly increased dextrose of the meal as absorption continued, resulting in rapidly increased blood sugar. A normal individual, irrespective of the amount of his food intake, will maintain the blood sugar at a constant normal level, except perhaps after meals, when it is slightly elevated, but always within the normal physiologic limit.

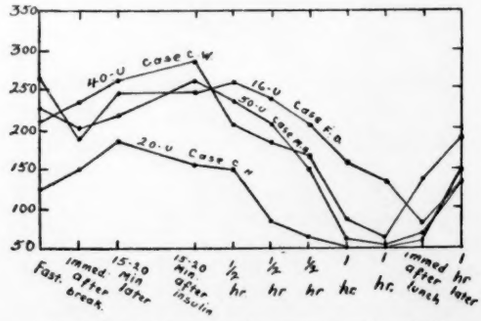

Chart 2.—Ordinary insulin group (meal period).

Next we proceeded to determine the effect of ordinary insulin on the blood sugar during the absorption of a meal as compared with protamine insulin. In prescribing ordinary insulin we gave it within fifteen to twenty minutes after meals [7] during the inception of absorption of the dextrose of the meal. The dosages of ordinary insulin varied from 16 to 50 units. Diet proportions were similar to those given the protamine patients (table 2). This is graphically illustrated in chart 2.

The interesting fact revealed following these observations was that ordinary insulin is absorbed with extreme rapidity. The ordinary insulin, as compared with the protamine insulin, was better able in all the cases in the group to oxidize the rapidly absorbed dextrose of the meal, causing a rapid oxidation of the dextrose so that a normal or slightly below normal blood sugar level was maintained for from two to two and one-half hours before the next meal (lunch). It appears from these observations that the patients received the beneficial effects of the rapid oxidizing action of the insulin on the dextrose throughout the absorption period of the breakfast by maintaining a nearer-to-normal blood sugar level as compared with the protamine insulin group. With the next meal (lunch) the beneficial effects of the insulin on the metabolic system were still evident in the reduced level of the blood sugar an hour after lunch as compared with the blood sugar level an hour after breakfast when insulin was administered.

TABLE 2.—*Ordinary Insulin Group (Meal Period)*

							B Sugar			Blood Sugar							
							Breakfast									Lunch	
Patient	Sex	Age	Weight	Duration of Disease	Complications	Previous Treatment: Diet, Insulin	Fasting Blood Sugar	Immediately After	15-20 Min. Later	0-Insulin	15-20 Min.	½ Hr.	½ Hr.	½ Hr.	1 Hr.	1 Hr.	After	1 Hr.
F. D. (1)	♂	62	178	10 yrs.	Retinitis	Diet	260	183	243	16	243	260	240	207	157	134	80	134
C. W. (2)	♀	60	153	8 yrs.	None	Diet	217	234	260	40	286	203	183	166	85	60	134	183
M. A. (3)	♀	59	164	7 yrs.	None	Diet	224	200	217	50	260	235	207	150	60	50	68	134
C. H. (4)	♂	34	167	2 yrs.	None	Diet	125	150	183	20	157	150	80	63	50	50	55	150

We then proceeded to determine the effect of the protamine insulin, as compared with the ordinary insulin, on the blood sugar during the resting interval: the period when the patient retires, from 12 midnight to 7 a. m., when no food is given. These patients under examination had been confined to bed several days previously to our examination. The purpose, of course, was to make certain that no previous disturbance would interfere with our examination. When studies with protamine insulin were made, a blood specimen was obtained at midnight, followed immediately by a dose of protamine insulin; then another blood specimen was taken at 4 a. m. and again at 7 a. m. for sugar estimations. Similar tests were made with ordinary insulin.

Three groups of three patients were examined—one group of three patients with protamine insulin, the other group of three with ordinary insulin, and finally a control group of three patients to whom no form of insulin was administered but blood sugar specimens were obtained at midnight, 4 a. m. and 7 a. m.

Thus for clarification the results obtained in each group of patients during the resting interval were tabu-

lated. For the protamine insulin group dosages varied from 16 to 30 units (table 3). This is graphically illustrated in chart 3.

The slight protamine insulin action occurred from midnight to 4 a. m. and increased slightly from 4 a. m. to 7 a. m., thus emphasizing the delayed, slow and prolonged insulin action.

TABLE 3.—*Protamine Insulin Group (Rest Interval)*

Patient	Sex	Age	Weight	Duration of Disease	Complications	Previous Treatment, Diet, Insulin	B Sugar at 12 p. m.	P Insulin Dose	Blood Sugar 4 a. m.	Blood Sugar 7 a. m.
A. L.	♂	67	138	7 yrs.	None	Both	100	20	93	70
B. M.	♀	59	148	9 yrs.	Ulcer right large toe	Both	191	30	180	176
S. R.	♀	48	155	4 yrs.	Uterine fibroid	Both	141	16	134	126

With the ordinary insulin the reduction of the blood sugar was more pronounced, as shown in table 4. The dose of ordinary insulin varied from 10 to 30 units.

Chart 4 illustrates the steep reduction of the blood sugar caused by the ordinary insulin as compared with the slight, slow, "somewhat straight line" decline of the blood sugar caused by the protamine insulin. With ordinary insulin the maximum effects on the blood sugar were obtained from midnight to 4 a. m. From then on it appeared to lose its effectiveness. What reduction of the blood sugar occurred after 4 a. m. was probably due to the beneficial effects produced on the liver and muscle gylcogen function by the insulin action from midnight to 4 a. m.

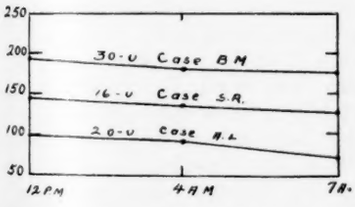

Chart 3.—Protamine insulin group (rest interval).

In the control diabetic group in which no form of insulin was administered there was a gradual increase in the morning blood sugar above the midnight level (table 5).

On the basis of these clinical studies I agree with Hagedorn and other investigators that, when protamine insulin compound is given hypodermically, a slow but continuous disintegration of the compound takes place which slowly liberates the active insulin. The duration of the disintegration and the rate of absorption of the active insulin have been affected somewhat by the practice of adding zinc to insulin compound [8] for the purpose of further prolonging the protamine insulin action. Other factors affecting its action are individual susceptibility to the compound, age, the duration of the diabetes and the condition of the cardiovascular system.

Indiscriminate use of the compound may subject the patient to unfavorable disturbances or symptoms. Lawrence [9] already has shown its inability to control the hyperglycemia of the meal caused by the dextrose of high carbohydrate diets. Gray [10] also appears to be disappointed with protamine insulin compound. Allen [11] speaks of more violent fluctuations of the hyperglycemia and hypoglycemia with protamine insulin than with the old insulin. Fortunately, we have had no cases of protamine insulin hypoglycemia reactions in patients with extensive premature cardiovascular sclerosis. I feel that if such reactions did occur in such patients they would probably be more serious than with the ordinary insulin because of their longer duration, since hypoglycemia reactions, as shown by Ernstene and his co-workers,[12] have a deleterious effect on the myocardium.

8. Scott, D. A., and Fisher, A. M.: The Effect of Zinc Salts on the Action of Insulin, J. Pharmacol. & Exper. Therap. **55**: 206 (Oct.) 1935.
9. Lawrence, R. D., and Archer, Nora: Some Experiments with Protamine Insulinate, Brit. M. J. **1**: 749 (April 11) 1936.
10. Gray, P. A.: Personal communication to the author, Sept. 9, 1936.
11. Allen, F. M.: Some Difficulties Arising in the Use of Protamine Insulinate, J. A. M. A. **107**: 430 (Aug. 8) 1936.

PROBABLE ULTIMATE EFFECTS ON THE DIABETIC METABOLISM

Forsgren [13] has shown by histochemical methods that the carbohydrate metabolism of the body undergoes a cyclic change. Agren and his co-workers [14] also found a rhythmic change in the liver with alternate glycogen production and bile secretion. Through a series of numerous experiments, Higgins and his co-workers [15] have shown that the food intake determines the cyclic changes that occur in the liver following feeding. They were able to vary the cyclic changes in liver and muscle by changing the feeding time. This is the opposite view of Möllerström.[16] Therefore isn't it important to have the dextrose of the meal properly oxidized, so as to effect proper glycogen storage and help to maintain normal cyclic changes in the liver and muscles? I believe that the more complete the oxidation of dextrose of the meal in diabetes, the more normal will be the blood sugar throughout the period of its absorption, the better the glycogen storage and function of liver and muscle, and hence the better the metabolic equilibrium. There would result in all probability fewer diabetic complications such as gangrene, coronary disease or visual disturbance. Premature arteriosclerosis in diabetes would be further delayed, approaching probably the normal time in its inception. A large percentage of the insulin patients would be able to discontinue insulin therapy.

TABLE 4.—*Ordinary Insulin Group (Rest Interval)*

Patient	Sex	Weight	Age	Duration of Disease	Complications	Previous Treatment	B Sugar at 12 p. m.	O Insulin Dose	Blood Sugar 4 a. m.	Blood Sugar 7 a. m.
L. M.	♀	118	72	7 yrs.	Retinal hemorrhage	Diet	231	30	72	70
S. M.	♀	148	59	9 yrs.	Ulcer of right foot	Both	217	20	142	120
S. R.	♀	155	48	4 yrs.	Cataracts	Both	162	10	94	112

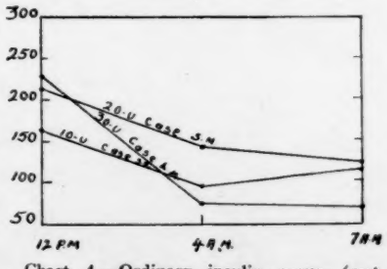

Chart 4.—Ordinary insulin group (rest interval).

12. Ernstene, A. C.; Riseman, J. E. F.; Stern, Beatrice, and Alexander, Benjamin: The Mechanism of the Circulatory Changes Accompanying Insulin Hypoglycemia, Am. J. Physiol. **111**: 440 (March) 1935.
13. Forsgren, E., quoted by Möllerström.[16]
14. Agren, Gunnar; Wilander, Olof, and Jorpes, Erik: Cyclic Changes in Glycogen Content of the Liver and Muscles of Rats and Mice, Biochem. J. **25**: 777, 1931.
15. Higgins, G. M.; Berkson, Joseph, and Flock, Eunice: The Diurnal Cycle in the Liver of the White Rat: Food, a Factor in Its Determination, Am. J. Physiol. **105**: 177-186 (July) 1933.
16. Möllerström, Jakob: Periodicity of Carbohydrate Metabolism and Rhythmic Functioning of the Liver, Arch. Int. Med. **52**: 649 (Nov.) 1933.

Thus in a group of eighty-five diabetic patients who had had treatment previously to coming to our diabetic clinic, I was able when administering insulin after meals to effect such a reduction of the increased hyperglycemia of the food that discontinuance of insulin therapy resulted in 60 per cent of the cases, reduction of the total daily dosages resulted in 20 per cent, while in the remaining 20 per cent all of them of such severity, the insulin dosage was slightly increased.[17]

The slowly acting protamine insulin appeared to have little or no effect on the rapidly absorbed dextrose of the higher carbohydrate meal. However, within an hour before lunch the blood sugar of the protamine group was slightly reduced below the original fasting sugar, owing in all probability to the fact that absorption of the food had been completed, an absorption coupled with a slight insulin absorption and action from the protamine compound. But the blood sugar rapidly increased, rising to abnormal heights immediately after lunch and an hour later as recorded by the blood sugar estimation, perhaps continuing to increase until the end of absorption. The fact remains that absorption of protamine insulin is too slow to oxidize the rapidly absorbed dextrose of the meal for from two to three hours after eating.

TABLE 5.—*Control Diabetic Group (Rest Interval)*

Patient	Sex	Age	Weight	Duration of Disease	Complications	Previous Treatment, Diet, Insulin	Blood Sugar		
							12 p. m.	4 a. m.	7 a. m.
S. R.	♀	48	155	4 yrs.	Cataracts	Both	125	128	130
S. M.	♀	59	148	9 yrs.	Gangrene of right foot	Both	180	190	234
A. L.	♂	66	138	6 yrs.	None	Both	158	160	166

What will be the immediate effect on the metabolic system of these sudden increases in blood sugar to abnormally high levels maintained perhaps for two or more hours? What would the latent effects be if the increased hyperglycemia were repeated after each meal, extended over periods of months and years, even though the fasting blood sugar was normal and in spite of the fact that the patient shows no immediate external manifestations? The answer to these questions will, of course, depend on the height of the abnormal blood sugar level, the duration of this abnormal level during the absorption of the food, the age of the patient, the condition of his cardiovascular system at the time of its onset, the state of his liver function and the duration of his diabetes.

Probably the immediate effects of this incomplete oxidation of the carbohydrate of the meal are a slight interference with the liver function, especially its rhythmic action—glycogen production and bile secretion. If the incomplete or disturbed carbohydrate oxidation continues after each meal and is extended over a period of months and years, will not the disturbed metabolism produce marked effects, however latent? These latent effects in all probability manifest themselves in premature sclerotic changes in diabetic patients.

The chemical disturbances that are responsible for these premature changes are still in doubt. Patchy distribution of the lesions in arteriosclerosis suggests some preceding local condition in the involved areas which favors the precipitation of lipoids.[18] Warren[19] is of the opinion that the effect of the high sugar concentration and its fluctuation in persons with diabetes possibly lead to swelling of the intimal ground substances through changes in osmotic pressure and thus favor lipoid inhibition. It is generally believed that, when the blood sugar rises following a meal, the cholesterol rises also, the continued hyperglycemia leading to disturbance of the cholesterol metabolism.[20] Why isn't the increased hyperglycemia and its fluctuations, which occur invariably during the absorption of the meal and are repeated after each meal, accompanied probably by a rise or disturbance in cholesterol, the factors most likely to produce the local condition of the arterial walls? Since the consensus is that a disturbance in cholesterol metabolism plays an important part in the etiology of arteriosclerosis, isn't it justifiable to infer that the incomplete oxidation of dextrose of the meal may disturb the rhythmic or glycogen function of the liver and help to disrupt cholesterol metabolism as well as to effect vascular damage favoring precipitation of lipoids and eventually bring about premature sclerotic changes? Perhaps such disturbance may not necessarily manifest itself by hypercholesteremia but by disturbed cholesterol metabolism, even though blood cholesterol is normal; perhaps over a long period of months or years it will help to bring about premature sclerosis. Duff[21] states that arteriosclerosis in a man can and usually does develop without deviation of the cholesterol content of the blood beyond the normal limits of variation.

Recently there has been a change in the ratio of carbohydrate and fat in the diets to a high carbohydrate and low fat content. Such a change of ratio has caused, according to Rabinowitch,[22] Joslin[23] and others, a delay in the period of inception of arteriosclerosis. But in spite of this it still makes its inception prematurely in diabetic patients as compared with the nondiabetic.

In view of the fact that sclerotic changes are prevalent prematurely in diabetic patients, there are reasons enough to believe that the extent of the disturbed cholesterol metabolism, as well as the sclerotic changes, will depend on the state of the carbohydrate metabolism. Thus there are patients who appear to control their diabetes for years without artificial insulin because they have a normal fasting blood sugar. This is in all probability due to the fact that they possess sufficient circulating endogenous insulin to metabolize their own carbohydrate. But for an interval of perhaps one to three hours following each high carbohydrate meal the blood sugar becomes increased above the normal level, probably causing a rise or a disturbance of the cholesterol metabolism. If this increased hyperglycemia should be extended over a period of years, it would more than likely cause a disturbance of glycogen function of liver and muscle and various other of the metabolic disorders or complications so common in diabetes. To cite one of the many cases that have come under observation:

A man, aged 66, weighing 187 pounds (85 Kg.), who suffered from diabetes for at least seven years, had been treated by his physician with diet and insulin. His diet was liberal;

17. Sindoni, Anthony, Jr.: Vitamin Deficiency in Prescription Diets of Diabetics, Am. J. Digest. Dis. & Nutrition **3**: 759 (Dec.) 1936.

18. Graybeil, Ashton, and White, P. D.: Diseases of the Heart: A Review of Some Contributions Made During 1935, Arch. Int. Med. **57**: 791 (April) 1936.

19. Warren, Shields: The Pathology of Diabetes Mellitus, Philadelphia, Lea & Febiger, 1930, p. 139.

20. Page, I. H.: Personal communication to the author, Aug. 25, 1936.

21. Duff, G. L.: Experimental Cholesterol Arteriosclerosis and Its Relationship to Human Arteriosclerosis, Arch. Path. **20**: 81 (July), 259 (Aug.) 1935.

22. Rabinowitch, M. I.: Arteriosclerosis in Diabetes: I. Relationship Between Plasma Cholesterol and Arteriosclerosis; II. Effects of the High Carbohydrate-Low Calory Diet, Ann. Int. Med. **8**: 1436-1474 (May) 1936.

23. Joslin, E. P.: Fat and the Diabetic, New England J. Med. **209**: 519 (Sept. 14) 1933.

in fact it was increased at various intervals because of his frequent low fasting blood sugar. When he first was examined three years previously his fasting blood sugar was 113 mg.; two hours after meals it was 190 mg., in spite of the fact that his blood cholesterol was increased only within the normal range. Three months later he was admitted to the hospital suffering from diabetic gangrene in the little toe of the left foot and retinal hemorrhage in both eyes.

Even though his fasting blood sugar was normal, he was not properly oxidizing the dextrose of the meal, as was evidenced by the increased hyperglycemia two hours after meals. This condition had perhaps continued over a period of years and finally manifested itself by marked premature sclerotic changes. Perhaps the disturbance of cholesterol in the case cited, though not amounting to an abnormal increase, was more pronounced with the increased hyperglycemia. And perhaps the hyperglycemia extending over a period of months and years hastened or probably aided in causing the vascular changes. Thus if increased blood sugar fluctuation above the normal level is considered a possible factor in producing an injury to the arterial walls (as it does, according to Warren), increased cholesterol, according to Duff, or disturbed cholesterol metabolism will probably accelerate the development of arteriosclerosis. This, of course, is in agreement with many observers who find increased or disturbed cholesterol accompanying marked sclerosis of diabetic patients.

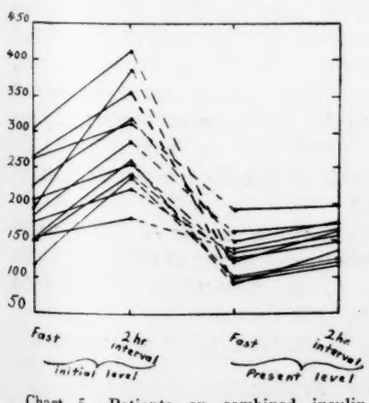

Chart 5.—Patients on combined insulin therapy (protamine and ordinary).

These observations emphasize perhaps the fallacy of attempting to determine by fasting blood sugar estimations only the oxidizing power of the diabetic patient for dextrose. Blood sugar estimations during the absorption of the food would demonstrate more clearly the patient's oxidizing power and state of progress and the state of the insulin secreting mechanism, as well as that of the liver glycogen or its rhythmic function.

Thus with these facts in mind I felt that protamine insulin should be prescribed only as an aid to ordinary insulin and then only when the patient retired or in the morning after breakfast following the ordinary insulin.

TABLE 6.—*Patients on Combined Insulin Therapy (Protamine and Ordinary)*

Patient	Age	Sex	Duration of Disease	Complications Present	Previous Treatment, Diet, Insulin	Initial Blood Sugar		Duration of Treatment	Present Blood Sugar		Reduction in Insulin		Comment
						Fasting	2 Hr. After Meal		Fasting	2 Hr. After Meal	Protamine	Ordinary	
R. S.	73	♀	10 yrs.	Carcinoma of right breast, furuncle on chest	Both	303	410	7 wks.	134	156	4	10	Patient at present having x-ray therapy to breast; "feels fine"
S. M.	48	♀	8 yrs.	None	Both	157	183	6 wks.	138	166	8	8	Feels "fine," more "pep"
W. R.	66	♂	9 yrs.	Retinal hemorrhage	Both	118	197	4 wks.	127	157	..	4	Vision not improved; feels better
A. D.	38	♀	9 yrs.	Infection of right thumb with osteomyelitis	Both	197	386	8 wks.	88	134	8	14	Patient has had two operations on thumb (gas anesthesia); feels fine; healed
M. C.	55	♀	7 yrs.	Retinitis	Both	203	257	2 mos.	93	118	4	13	Feels well, better since on protamine insulin
N. G.	11	♀	3 yrs.	None	Both	150	243	2 mos.	128	145	..	2	Enjoys better health
D. R.	14	♂	5 yrs.	None	Both	226	326	6 mos.	130	148	..	..	Forced to increase protamine and ordinary insulin; feels fine
C. W.	49	♀	10 yrs.	Thyroid (toxic)	Both	263	320	2 mos.	188	197	..	..	Refused surgical intervention; at present on x-ray therapy
L. B.	51	♀	11 yrs.	Ulcer of large left toe	Both	150	263	2 mos.	93	120	4	..	Toe healed; patient well
A. V.	74	♀	18 yrs.	Gangrene of right large toe	Both	118	230	2 mos.	98	126	10	16	Patient had a high amputation; good recovery; insulin discontinued
D. S.	55	♀	12 yrs.	Retinal hemorrhage	Both	183	287	4 mos.	166	176	4	12	Feels better; no visual improvement
M. R.	64	♀	14 yrs.	Retinitis	Both	166	234	4 wks.	138	146	..	..	Feels better; more "pep"

The reasons for advocating protamine insulin after breakfast following the ordinary insulin are: 1. When protamine insulin was given one-half hour before breakfast it appeared to have little or no effect on the fasting blood sugar or on the blood sugar during the first four hours of the resting interval. 2. The effects of protamine are too delayed to oxidize the rapidly increased hyperglycemia caused by the breakfast of those on the higher carbohydrate diets. 3. No apparent advantage is gained by prolonging the interval between protamine insulin injection and the time of eating breakfast; probably, on the other hand, it increases the discomfort of the patient. During the interval from breakfast to supper, ordinary insulin after meals [7] should be given because its rapid absorption and action as well as its short duration results in a more complete oxidation of the rapidly absorbed dextrose of the meal. Page [20] states that ordinary insulin itself, while sharply lowering the blood sugar, tends also to reduce the cholesterol within a period of three hours after its administration to rabbits. In advocating the combined insulin therapy, I feel that by its use the elevation of the blood sugar caused by the absorption of the dextrose of the meal could be reduced more nearly toward the normal level.

CLINICAL APPLICATION OF THE OBSERVATIONS

For clinical trial and treatment a group of patients was selected for whom we prescribed combined protamine and ordinary insulin. Our purpose was to deter-

mine their effects on the increased hyperglycemia of the food as well as on the fasting blood sugar level. The ages of the patients varied from 11 to 74 years; the duration of the treatment varied from four weeks to six months. A large number of the patients had been treated by diet and ordinary insulin previous to coming under our care. Many suffered from various forms of complications in spite of the fact that they had a somewhat normal fasting blood sugar on their initial examination. Table 6 explains the results achieved in a few of the many cases, graphically illustrated in chart 5.

The interesting facts from our observations revealed that many of the patients, in spite of the normal fasting blood sugar level on the initial examination, showed a marked increase during the absorption of the food even though they had been previously treated by diet, insulin, or both. Such patients are probably among the large group who suffer from marked premature sclerotic changes and diabetic complications.

An important fact observed among the few of our patients on the combined insulin therapy was that in spite of the low blood sugar immediately before breakfast and also at the end of the two hour interval, which would ordinarily produce symptoms of hypoglycemia in the average diabetic patient, they felt well. Some patients at the end of the two hour interval had a blood sugar level as low as 50 mg. without any apparent discomfort.

SUMMARY OF OBSERVATIONS

1. Incomplete oxidation of the dextrose of the meal, as evidenced by the increased hyperglycemia occurring after each meal, extended over a period of months and years may bring about a disturbance in the cyclic glycogen function of the liver and muscles (Möllerström, Forsgren, Higgins, Agren and his co-workers) and alterations in the arterial walls (Warren), though perhaps these alterations are brought on by an injury of some kind (Duff). These alterations in the arterial wall precede the precipitation of lipoids [24] and initiate the premature sclerotic changes so common in diabetic patients and increase in or disturbance of cholesterol metabolism, which accelerates the development of premature sclerotic changes.

2. Blood sugar estimation following meals during its absorption would reveal the extent as well as the progress of the patient's oxidizing power for dextrose.

3. A fasting blood sugar estimation is not a reliable and complete index to a patient's oxidizing power of dextrose or his progress.

4. Protamine insulin compound is absorbed too slowly to oxidize the rapidly absorbed dextrose of the high carbohydrate diets advocated today; hence it is unable to control the increased hyperglycemia.

5. Ordinary insulin within fifteen to twenty minutes after meals, because of its rapid absorption and action, is superior to protamine insulin to oxidize the rapidly increased hyperglycemia of the higher carbohydrate meal, and hence it is better able to reduce the increased hyperglycemia.

6. It is not advisable to give protamine insulin before meals because (1) if given a half hour before breakfast it has little or no appreciable effect on the blood sugar; (2) a longer interval between the injection and the eating of a meal may subject the patient to much unnecessary discomfort; (3) it should not be given during the day with the thought of affecting the dextrose of the following meal; (4) no advantage is gained in any case, since the rapid absorption of the dextrose of the meal will rapidly increase the hyperglycemia; (5) the maximum effects of protamine insulin are usually obtained several hours or, occasionally, as has been reported, from three to four days after the time of injection.

DISADVANTAGES OF PROTAMINE INSULIN

1. Because of its slow absorption and action, protamine insulin compound cannot control the hyperglycemia of the high carbohydrate diets advocated today or the increased hyperglycemia caused by such diabetic complications as acidosis, coma, infections or gangrene.

2. Protamine insulin, being slow acting, may involve the physician in the error of giving too frequent injections or too large doses in his effort to reduce quickly the blood sugar in a patient with severe or moderately severe diabetes. He may find that he has produced cumulative effects having such serious consequences as a continuous mild hypoglycemic reaction or one sufficiently severe as perhaps to prove fatal in advanced heart disease.

3. Patients on protamine insulin, aware of its unfavorable action—such as its cumulative effects—may become self conscious or fearful of its slow-acting hypoglycemic reaction. This may cause them to eat more or less continuously at the first sign or symptom of uneasiness, which may not infrequently be a hypoglycemic reaction. Then again they may fall into a mild mental confusion and, not infrequently, into unconsciousness without much warning.

4. After protamine insulin is given, the prolonged insulin effect may continue when perhaps not much insulin action is desired—at the completion of absorption of the meal. Thus, normally, increased insulin secretion and action is desired after meals during its absorption; less is desired after its absorption. When much insulin secretion and action are desired during absorption of the meals, protamine insulin is too slow or insufficient; when less is desired on completion of absorption of the meal, protamine insulin may be too rapid or too excessive. Perhaps a patient for some reason is forcibly detained in some locality, which makes it impossible for him to obtain his required proportioned meal. What effect will protamine insulin have on him, especially when he knows that he has had a protamine insulin injection the night before and that a hypoglycemic reaction is possible? It would probably aggravate his mental state and help the simulation of hypoglycemic symptoms.

5. To use two different preparations of insulin and to inject the two separate preparations at different times of the day in relation to the absorption of the food may be confusing to diabetic patients.

6. Protamine insulin is unstable after six months.

ADVANTAGES OF PROTAMINE INSULIN

1. With one injection of protamine insulin when the patient retires, the blood sugar—as shown by our experiments during the resting period or the interval on retiring and arising—is slowly reduced, indicative of the delayed, slow, prolonged but continuous insulin action. This effect will avoid the necessity of awakening the patient who previously required an early morning dose of ordinary insulin at from 3 to 4 a. m.

2. When protamine insulin is prescribed as an aid to ordinary insulin in severe or moderately severe diabetes

24. Leary, Timothy: Experimental Atherosclerosis in the Rabbit Compared with Human (Coronary Atherosclerosis), Arch. Path. **17**: 453 (April) 1934.

it will more completely oxidize and reduce the marked hyperglycemia of the food than the single ordinary insulin.

3. Such combined insulin therapy (ordinary and protamine insulin) will frequently reduce the total number of units per day, shorten the period of insulin therapy and further increase the well being as also the resistance of the patient, as already shown by our experiments.

4. Surgical wounds as well as infections respond better on the combined insulin therapy.

CONCLUSION

1. Since protamine insulin is inadequate to oxidize the rapidly absorbed dextrose of the meal, it should not be prescribed alone but only as an aid to ordinary insulin. Together they form an ideal insulin therapy in diabetic patients requiring large doses of ordinary insulin. Protamine insulin, if indicated, should be given on retiring and if necessary after breakfast, immediately following the ordinary insulin, which is given within from fifteen to twenty minutes after meals. Between meals the dextrose of the meal that escaped oxidation of the ordinary insulin may be oxidized by the slow, continuous action of the protamine insulin. This combined form of insulin therapy approaches more nearly the natural insulin secretion and action in oxidizing the increased blood sugar caused by the absorption of the carbohydrate of the meal than probably any single insulin preparation so far advocated.

2. This combined insulin therapy, ordinary insulin and protamine insulin, is advocated in:

(*a*) Any type of diabetes requiring large doses of ordinary insulin.

(*b*) Preoperative and postoperative cases.

(*c*) Acidosis and coma cases.

(*d*) Patients with marked fluctuations of blood sugars.

(*e*) Elderly diabetic patients with advanced sclerosis of the cardiovascular system—though in these cases the greatest care should be exercised.

(*f*) Cases complicated with infections.

3. Fasting blood sugar estimation (before breakfast) alone, as practiced by the majority of physicans, is no complete reliable index to the progress of the patient's diabetic condition or oxidizing power of carbohydrate.

4. A blood sugar estimation two hours after meals gives a better index to a patient's oxidizing power.

5. It is advisable, therefore, in order to obtain a better index to the patient's oxidizing power of carbohydrate, as well as his progress, to obtain a fasting blood sugar estimation as well as one after meals, i. e., a two hour interval. The latter examination should be repeated in preference to the blood sugar estimation before eating of the meal at various intervals, so as better to estimate and adjust the insulin dose and diet. This will help to obviate much of the blood sugar fluctuation and insulin reaction and to control better the metabolic state of the diabetic patient. It will also be more convenient for the patient to come after he has had his breakfast instead of before.

6. With the combined insulin therapy (ordinary insulin and protamine insulin) much will be accomplished; i. e., a better and more complete oxidation of the hyperglycemia of the food resulting in nearer to normal sugar curve after meals, a smaller likelihood of disturbances of cholesterol metabolism, a better glycogen storage in liver and muscles and, hence, an improvement in their rhythmic function. This will result in a better metabolic equilibrium and, in all probability, help in further delaying the period of inception of premature arteriosclerosis.

7. Patients should be hospitalized before attempting the use of protamine insulin. The purpose of course, in addition to other factors, is to test their reaction and susceptibility to the compound.

8. Considering the advantages as well as the disadvantages of protamine insulin and ordinary insulin, I feel that ordinary insulin therapy, if properly administered in relation to dextrose absorption, is still the rock foundation of insulin therapy in diabetes and superior to protamine insulin, especially in those on high carbohydrate diets. The combined insulin therapy (ordinary and protamine insulin) has better helped to solve the problem of reducing the marked hyperglycemia of the food than any single insulin preparation advocated today. Such reduction of the food hyperglycemia approaching the normal curve will result in delaying premature arteriosclerosis, help to prolong the span of life and period of usefulness, and increase resistance to infection.

9. If a diabetic patient is responding favorably with small doses of ordinary insulin after meals that maintain a blood sugar that is within the normal level two hours after meals, it is not advisable to use protamine insulin.

1315 Pine Street.

INCIDENCE OF CORONARY SCLEROSIS AMONG PHYSICIANS

AS COMPARED WITH MEMBERS OF OTHER OCCUPATIONS

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It has long been believed that the incidence of coronary sclerosis was higher in certain vocations than it was in others. Writers formerly observed that it was relatively rare in the public wards of hospitals as compared with the private wards. Osler observed that it was not a condition affecting the working classes. Colbeck concluded that it was uncommon among blacksmiths, soldiers and other laborers. Attention has been called to the importance of stress, strain and worry as predisposing causes of this disease. It has been described as a disease of the "intelligentsia." Several writers have called attention to its prevalence among physicians, and it has even been described as the "disease of doctors." Some writers have expressed the opinion that it was evidence of eminence and that if a physician acquired the disease it was proof that he had reached the height of professional success. In a series of cases reported by Osler, a large proportion of the patients were physicians. Many members of the medical profession have been victims of coronary sclerosis. Some of the distinguished members of the profession who have succumbed to this disease are John Hunter, Charcot, Nothnagel and Pepper. Others who recently have been victims are Martin, Howard, Saylor, Manges, McVicar and Funk.

This study consists of a comparison of the incidence of coronary sclerosis among physicians, bankers, lawyers, clergymen, laborers and farmers among the clientele of the Mayo Clinic. I examined the consecutive

From the Section on Cardiology, the Mayo Clinic.

clinical records of 307 physicians, 300 bankers, 304 lawyers, 306 clergymen, 306 laborers and 308 farmers and compared the incidence of coronary sclerosis in each group. There were thirty-three instances of coronary sclerosis among the physicians, sixteen among the bankers, fourteen among the lawyers, fourteen among the clergymen, eight among the laborers and eight among the farmers (table 1). The criteria for the diagnosis were the same in all the groups. Therefore I feel that the error in diagnosis should be the same in all groups. The average age of the patients, which was about the same for all groups, was 52.8 years for the physicians, 51.5 for the bankers, 52.8 for the lawyers, 52.2 for the clergymen, 50 for the laborers and 53.1 for the farmers. The average age for the different groups is about the same, with the exception of the laborers, and I do not believe that the difference in the average age of the patients in this group is significant. The fact that the individuals in this group were slightly younger than were the others may partially explain why the incidence of coronary sclerosis is less in this group.

TABLE 1.—*Incidence of Coronary Sclerosis According to Occupation*

Occupation of Patients	Clinical Records Studied	Incidence of Coronary Sclerosis	
		Cases	Per Cent
Farmers	308	8	2.5
Laborers	306	8	2.6
Clergymen	306	14	4.6
Lawyers	304	14	4.6
Bankers	300	16	5.3
Physicians	307	33	10.7

I have given the incidence rates (percentage of total patients who had coronary sclerosis) by decades of age to 70 years or more (table 2). For the entire series of 1,831 patients it is interesting to note that the incidence of coronary sclerosis increases steadily with age to old age. In the age group 20-29 years there were no cases of coronary sclerosis. For the age period 30-39 years the rate was 0.5 per cent, for the period 40-49 years it was 2.5 per cent, for 50-60 years it was 5.9 per cent, for 60-69 years it was 9.2 per cent, and for the age period 70 years and more it was 10.6 per cent. When the individual occupation groups were considered separately, it is seen that at every decade of age the greatest relative incidence occurs among physicians. The bankers and lawyers come next in order, after that come the clergymen, and lastly come the farmers and laborers. This ordering holds only generally; at particular decades of age there are exceptions. Notably the laborers show a large relative incidence (12.8 per cent) in the age decade 60-69 years. It should be kept in mind, however, that when the entire series of patients is divided into subgroups according to occupation and age there are only relatively small numbers of cases from which to calculate rates, and these are therefore subject to considerable statistical variability. The figures given are intended only to provide a general comparison of the incidence rates for the members of various occupations studied at different decades of life.

TABLE 2.—*Incidence of Coronary Sclerosis According to Age and Occupation*

Age of Patients, Years	Physicians			Bankers			Lawyers			Clergymen			Farmers			Laborers			Total		
		Coronary Sclerosis			Coronary Sclerosis			Coronary Sclerosis			Coronary Sclerosis			Coronary Sclerosis			Coronary Sclerosis			Coronary Sclerosis	
	Number	Number	Per Cent	Number	Number	Per Cent	Number	Number	Per Cent	Number	Number	Per Cent	Number	Number	Per Cent	Number	Number	Per Cent	Number	Number	Per Cent
20-29	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
30-39	46	1	2.2	37	0	0	15	0	0	35	0	0	43	0	0	45	0	0	221	1	0.5
40-49	62	4	6.5	100	4	4.0	114	3	2.6	89	1	1.1	81	1	1.2	117	1	0.9	563	14	2.5
50-59	106	14	13.2	93	5	5.4	88	6	6.8	106	4	3.8	91	3	3.3	95	2	2.1	579	34	5.9
60-69	66	10	15.2	57	6	10.5	75	3	4.0	59	7	11.9	63	2	3.2	39	5	12.8	359	33	9.2
70 or more	22	4	18.2	13	1	7.7	12	2	16.7	17	2	11.8	30	2	6.7	10	0	0	104	11	10.6
Total	307	33	10.7	300	16	5.3	304	14	4.6	306	14	4.6	308	8	2.6	306	8	2.6	1,831	93	5.1

COMMENT

It is interesting to speculate why there is a much greater incidence of coronary sclerosis among physicians than among the other groups. I fully appreciate that in any study of this nature the figures and comparisons are subject to considerable statistical error, but the rate of incidence is so strikingly different in the various groups that I believe the difference is significant. For the group as a whole the highest incidence of coronary slcerosis is found among the physicians. In this group it is more than double what it is in any other occupation. It is four times as great among physicians as it is among laborers and farmers, and it is about twice as great among bankers, lawyers and clergymen as it is among laborers and farmers.

One might argue that the groups of patients studied here do not give a fair representation of the various groups of patients as they actually exist in various localities. This may be true, and this criticism may be made of the patients of any hospital or clinic because they are somewhat specialized and selected groups, and the percentages of members of the various occupations that constitute the clientele of the clinic may be different than the percentages as they actually exist.

There is another factor which may have made a difference in the results obtained here. That is, the physician is more concerned about his heart than are members of the other groups, and he is likely to seek an examination on less provocation than do the members of the other groups. This may be partially true and it is possible that this factor may be partially responsible for the greater incidence of coronary sclerosis among physicians. However, there is another factor which I believe will at least partially, if not completely, offset this influence, and that is the fact that at the clinic we examine a great number of physicians each year who come to Rochester for other reasons than their health, such as to visit clinics, observe operations, do special work and accompany patients. This would not be true of the other groups.

Just why should the incidence of coronary sclerosis be so high among physicians? I believe the following

is at least a partial explanation: It has long been recognized that stress, strain, intensity of work and mental worries are factors in the production of coronary sclerosis. A physician's schooling is long and intensive compared with that of the average banker and business man. Undoubtedly a doctor has used up a great deal of nervous energy by the time he has finished school. Secondly, the nature of a physician's work is much more strenuous, and he has not only the responsibility of health but oftentimes of life itself in his hands. A physician's routine work, which includes ordinary obstretric cases with their complications, broken legs, severe cardiac diseases, scarlet fever and diphtheria among children and pneumonia among the aged, and the responsibility of the surgeons, which is probably greatest of all, is actually or nearly as intense as that of the banker when there is a run on his bank. In other words, what is a crisis for the banker and business man is more or less routine for the physician.

I believe that one can reasonably conclude from this study that occupation does influence the incidence of coronary sclerosis, that the incidence is lowest among those who do manual labor and highest among those who do mental work, and it would seem that it is highest of all among physicians.

PROSTIGMIN AS AN AID IN THE DIAGNOSIS OF MYASTHENIA GRAVIS

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Our object in this communication is to demonstrate the value of prostigmin as an aid in the diagnosis of myasthenia gravis. In the course of the study this drug was used with immediate but transient improvement in nine cases of the disease, and with neither subjective nor objective changes in fourteen cases of various neurologic disorders. The value of this drug in the treatment of these patients will also be discussed.

In recent years interest in myasthenia gravis has been stimulated by the discovery of new therapeutic agents and by metabolic studies. Walker [1] in 1934 reported the improvement that resulted from the subcutaneous injection of physostigmine salicylate. This drug was tried because it was thought that the disease might be due to a curare-like poisoning of the motor nerve endings or the myoneural junctions. Feb. 8, 1935, Walker demonstrated before the Clinical Section of the Royal Society of Medicine the improvement that occurred in one case with prostigmin, an analogue of physostigmine. In April 1935 she [2] reported this case. After a subcutaneous injection of 2.5 mg. of prostigmin, ptosis and ophthalmoplegia disappeared within five minutes. The maximum effect was reached in one hour, and there was a gradual return to the previous state over a period of from six to eight hours. Prostigmin was considered superior to physostigmine because of a less depressing effect on the heart, the less frequent occurrence of nausea and vomiting, and the safety of administration of larger doses. In March 1935 Laurent [3] described improvement in seven cases with 2 cc. of prostigmin subcutaneously. He suggested that prostigmin might help in the diagnosis of early and slight cases. In May 1935 Pritchard [4] reported seven cases treated with prostigmin. His results were similar to those noted by Walker.

Shortly after the present report had been submitted for publication, Viets and Schwab [5] described a method of using prostigmin as a diagnostic test in myasthenia gravis. In five patients with the disease a rapid improvement took place in the symptoms and signs, while seven patients with other disorders showed only a slight response to the drug. Three cc. (1.5 mg.) of prostigmin and 0.6 mg. of atropine sulfate were injected simultaneously. Control injections with physiologic solution of sodium chloride gave no response. In a second report, by Viets and Mitchell,[6] further experience with the use of the drug is presented. They have now tested eighteen patients with myasthenia gravis and twenty-seven patients with other diseases such as progressive muscular dystrophy, recurrent ophthalmoplegia, progressive bulbar palsy and postencephalitic Parkinson's disease. The technic which they use is as follows: The patient is given 3 cc. of prostigmin with 0.6 mg. of atropine sulfate and the objective and subjective improvement in muscle power is tested at the end of ten and thirty minutes and one, two, four, six and eight hours. The response is graded by 0 indicating no change, 1 slight, 2 moderate, 3 marked and 4 complete improvement. Estimating both subjective and objective response on this basis at each test, a total score of 56 is possible. In the eighteen patients with myasthenia gravis the average test score was 30, and in the other conditions 1. The injections were given intramuscularly.

Hamill and Walker [7] reported the use of the drug in bulbar palsy, amyotrophic lateral sclerosis, alcoholic neuritis and traumatic neuritis. Some change was noted but it was less dramatic than that in myasthenia gravis.

Everts [8] administered prostigmin in two cases of myotonia congenita with a pronounced myasthenic syndrome, one case of alcoholic polyneuritis in which recovery had been slow, two cases of postencephalitic Parkinson's disease in which myasthenia was a factor, a case of facioscapulohumeral myopathy, and one of amyotrophic lateral sclerosis. He stated that all showed some improvement, but no details are given as to the doses of the drug or to the type, degree and rapidity of the response.

The following is a brief abstract of nine cases of myasthenia gravis in which prostigmin caused definite improvement.

CASE 1.—L. K., a Negro girl, aged 17 years, single, was in the ward from Aug. 27 to Oct. 13, 1935. Her family history was negative and her past history was good. One month before admission there was difficulty in chewing food. One week later ptosis, thick speech, regurgitation of water through the nose, transient diplopia, and weakness of the arms developed. Physical examination showed bilateral ptosis, more marked on the left; weakness of the right lateral rectus; nystagmus when she looked to the side, up or down; weakness of the jaw muscles bilaterally; bilateral facial weakness, more marked on

From the Medical Clinic of the Johns Hopkins Hospital.

We are indebted to Dr. Thomas R. Boggs for permission to use the City Hospitals cases, and to Dr. Allen F. Voshell for the Kernan Hospital case.

1. Walker, Mary B.: Treatment of Myasthenia Gravis with Physostigmin, Lancet **1**: 1200 (June 2) 1934.
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5. Viets, H. R., and Schwab, R. S.: Prostigmin in the Diagnosis of Myasthenia Gravis, New England J. Med. **213**: 1280 (Dec. 26) 1935.
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7. Hamill, P., and Walker, M. B.: The Action of Prostigmin (Roche) in Neuromuscular Disorders, J. Physiol. **84**: 36 P (May 13) 1935.
8. Everts, W. H.: The Treatment of Myasthenia Gravis by the Oral Administration of Prostigmin, Bull. Neurol. Instit. of New York **4**: 523 (Dec.) 1935.

the left, and weakness of the arms. She had the typical myasthenic electrical reaction. The Wassermann reaction was negative. The spinal fluid, urine and blood were normal. She was given subcutaneously 1.5 mg. of prostigmin and 0.6 mg. of atropine sulfate. Within ten minutes she was able to open her eyes wide and in twenty minutes the lips could be closed tight. She smiled and ate her lunch with ease. Diplopia disappeared. After thirty minutes the patient was laughing and expressed the desire to walk around. One hour later she was seized with violent abdominal cramps, which were relieved by more atropine sulfate. The beneficial effect gradually wore off after the first hour, and seven hours later her condition returned to its previous state. She was given 25 mg. of ephedrine sulfate and 7.5 Gm. of aminoacetic acid twice a day. On two further occasions 1 mg. of prostigmin produced striking improvement, and on a third occasion 0.75 mg. was given with only slight improvement. On discharge her condition was a little improved.

For ten months following discharge she did fairly well on aminoacetic acid and ephedrine. Her second admission was from March 24 to May 13, 1936. For two months before, the symptoms gradually increased. A few days before she contracted an infection of the upper respiratory tract and there was a more rapid exacerbation of symptoms. April 13, 1936, she was begun on prostigmin by mouth, 30 mg. three times a day. Combination of prostigmin with either aminoacetic acid or ephedrine did not seem to increase its effectiveness. For the following eight months there was distinct improvement. She was seen several times, and diplopia and slight ptosis were the only abnormalities remarked on. The effect of prostigmin orally became apparent about thirty minutes after it was taken and gradually decreased over two to three hours. Unless it was taken she was unable to eat or to be up. Her third admission was from Feb. 7, 1937, to the present time, and this was initiated by a cold accompanied by a generalized maculopapular rash. It is of interest that the first admission was preceded by a cold and a similar rash and that as a young child she had measles. During the first several days in the hospital there were frequent attacks of severe dyspnea during which respirations rose to 80 a minute. These attacks were promptly relieved by prostigmin, 1.5 mg. subcutaneously. They became less frequent, and now she is well maintained on prostigmin orally and ephedrine.

This represents a case that was improved for eight months by oral prostigmin and in which the acute episodes were satisfactorily controlled by this drug subcutaneously.

CASE 2.—L. L., a white man, aged 51, married, a farmer, was in the ward from Sept. 20, to Oct. 13, 1935. The family history was negative and the past history was good. For seven months there was blurred vision, for six and a half months diplopia and drooping of the right lid, and for six months drooping of the left eyelid. For five months his voice tired after he talked for from five to ten minutes; there was difficulty in swallowing toward the end of the meal, progressive weakness and fatigability, anorexia and constipation. All symptoms were more marked after exertion and improved after rest. He lost 30 pounds (13.6 Kg.) after the onset of the present illness. Physical examination showed bilateral lower facial weakness and loss of muscle tone. There was marked ptosis of both lids and complete paralysis of all eye muscles except the left lateral rectus. Tendon reflexes weakened rapidly on repeated stimulation. There was a typical myasthenic electrical reaction. The Wassermann reaction was negative. The spinal fluid, blood and urine showed no abnormalities. He was given 1 mg. of prostigmin and 0.6 mg. of atropine sulfate subcutaneously. Within three minutes ptosis decreased and in ten minutes the lids could be opened wide. In ten minutes the forehead could be wrinkled, and subjectively the heavy dull feeling around the eyes disappeared. Before the injection the sternocleidomastoid muscle began to weaken after twenty faradic stimulations. Ten minutes after the drug was injected the muscle contracted eighty times before weakening and in fifteen minutes more than 100 maximal contractions were obtained. A normal control showed weakening after 100 stimulations. The patient was given aminoacetic acid and ephedrine, but on discharge there was no improvement.

He was again seen in November 1936, at which time he still had severe symptoms. Prostigmin, 30 mg. three times a day by mouth, was given, but after three months of this treatment he did not notice any improvement in his symptoms.

CASE 3.—H. N., a white man, aged 64, married, merchant, was in the hospital from June 10 to July 15, 1935. He had enjoyed excellent health until Jan. 20, 1935. At that time he noticed diplopia, which was soon followed by bilateral ptosis, difficulty in swallowing, abnormal fatigue of the voice and weakness of the legs, arms and neck. He was better in the morning and worse at night, and exertion made the symptoms more marked. Physical examination showed bilateral ptosis and marked restriction of all the extra-ocular movement. The muscles of the face, jaw and neck were weak. After he counted to fifty his voice grew nasal. There was difficulty in swallowing. There was no anemia. The Wassermann reaction was negative. The urine showed a faint trace of albumin. The course was afebrile. June 11 he was placed on 25 mg. of ephedrine sulfate and 10 Gm. of aminoacetic acid three times a day. This was discontinued June 20. He was given from 1 to 2 cc. of prostigmin three or four times daily for three days. The response at first was very favorable. There was increased ability to swallow, to talk and to perform extra-ocular movements. The beneficial results decreased with the continued use of the drug, however, and for that reason its administration was discontinued. He was discharged unimproved and five months later died at home.

CASE 4.—M. A., a white woman, aged 33, single, whose first admission was from March 19 to July 10, 1931, had a negative family history and an excellent past history. Her present illness began three weeks before admisson with the sudden development of diplopia. The past history was entirely negative for myasthenic symptoms. Physical examination showed a divergent squint with weakness of the left internal rectus and slight ptosis on the left. The pupils reacted to light and in accommodation. There was a slight left facial droop. The visual fields were normal. The Wassermann reaction was negative. Examination of the blood, urine and spinal fluid revealed no abnormalities. While she was in the ward the course was afebrile with a slight tachycardia. At this admission the picture was not entirely clear, and she was discharged with the diagnosis of (?) encephalitis, (?) myasthenia gravis.

From July 15, 1931, to Oct. 19, 1932, she was seen at frequent intervals in the neurologic clinic. During that time the left internal strabismus remained practically constant. The left ptosis varied. Ptosis developed on the right. At times there was a slight facial weakness. She stated that at times her voice was weak toward evening, and that on one or two occasions she regurgitated fluids through the nose. There was a slight but steady increase in general weakness. From June 21 to Oct. 19, 1932, she was given ephedrine sulfate, 25 mg. three times a day. During this time a typical myasthenic reaction was obtained on stimulation of the sternocleidomastoid muscle. She was lost sight of from Oct. 19, 1932, until her second admission, Oct. 22, 1935. During this time she had been receiving no ephedrine and had been fairly well. During this period there were attacks appearing from four to five times a month which were characterized by increasing weakness, difficulty in speaking and swallowing, and increase in diplopia. These symptoms were apparently brought on by exertion but also occurred spontaneously. Each attack lasted for several days. One week before the second admission she contracted a cold and five days later there was marked weakness, swallowing was very difficult and speech disappeared entirely. The afternoon of admission she began to gasp for breath. On examination she was very poorly nourished and poorly developed; she was sitting up in bed, her breathing was rapid and shallow, and she was using the accessory muscles of respiration. The facial muscles were weak and toneless. There was bilateral ptosis and weakness of the left internal rectus. Complete aphonia and generalized muscular weakness were present. The deep and superficial reflexes were sluggish and tired easily on repeated stimulation. There were many large rhonchi throughout both sides of the chest and an area of bronchovesicular breathing beneath the left scapula. The temperature was 102 F., the pulse 104 and the respiration rate 36. She was immediately given 2 mg. of prostigmin and 0.6 mg. of atropine sulfate subcutaneously. Within five minutes the respirations were stronger. In ten minutes she was able to cough up mucus. In fifteen minutes there was a noticeable decrease in ptosis and she was able to whisper. In twenty-five minutes she talked in a weak voice and was able to

swallow liquids. After two hours ptosis increased again, and the voice and respirations became weaker. Over the next forty-eight hours she was given from 1.5 to 2 mg. of prostigmin thirteen times. The effect at first lasted from four to five hours, but later the duration of the action was much shorter, so that injections were necessary every one to two hours for relief of the extreme respiratory difficulty. She was also given 15 mg. of ephedrine sulfate three times a day and 20 Gm. of aminoacetic acid daily. Despite prostigmin, ephedrine, aminoacetic acid and supportive measures, she died from what appeared to be respiratory paralysis forty-eight hours after admission.

CASE 5.—A white man, aged 29, married, a farmer, who was admitted to the Johns Hopkins Hospital from July 13 to July 17, 1936, and whose past health was good, about a year before admission began to have difficulty in enunciating, and this progressed until his speech became almost unintelligible. At times food was regurgitated through the nose. There was some weakness of the extremities and he tired easily.

The general physical examination was negative. There was slight ptosis of the left lid, which increased when the lid was held open more than a few minutes. The jaws were so weak that the patient had to hold up the mandible with his hand. There was slight bilateral facial weakness. The soft palate and pharynx were weak, and the voice was nasal. The tongue could not be protruded for more than a moment, and then only the tip extended beyond the teeth. There was some weakness in abduction of the arms at the shoulders. No atrophy or fibrillary twitchings were seen. Sensation was everywhere normal. The reflexes were intact.

Faradic stimulation of the left deltoid and sternomastoid muscles caused fatigue after ten feeble contractions. Galvanic reactions were much better, prompt, and not suggestive of a reaction of degeneration.

The patient was given subcutaneously 1.5 mg. of prostigmin and 0.6 mg. of atropine sulfate. Within five minutes there was decided improvement. Ptosis of the left lid disappeared, speech improved, the jaw could be closed firmly, the tongue could be protruded freely, and the left arm could be held firmly in abduction. The nasal voice persisted.

The patient was discharged on aminoacetic acid 10 Gm. three times a day, and prostigmin 30 mg. three times a day, both to be taken orally. The diagnosis seemed clearly to be myasthenia gravis.

CASE 6.—A white man, aged 53, complained of drooping of the right eyelid and of weakness. For about five weeks there was occasional diplopia. For three weeks there were gradual drooping of the right eyelid and weakness of the arms and legs. For two weeks there was difficulty in mastication and for three days in swallowing. All these symptoms were increased by activity and decreased by rest.

The general physical examination was essentially negative. There was marked ptosis of the right eyelid. The right eye was divergent, could not be moved medially, and could be turned upward only slightly. The left eye moved medially very little. There was generalized weakness, worse in the left hand. The weakness increased on repeated effort and improved on rest. Sensation was normal. There was no atrophy or fibrillary twitching. The reflexes were intact. Electrical stimulation of the right sternomastoid muscle gave a myasthenic response.

Prostigmin 1.5 mg. and atropine sulfate 0.6 mg. were injected subcutaneously. Within five minutes there was complete disappearance of the ptosis, marked improvement in the extra-ocular movements, and increase in the strength of the jaw and hand muscles.

The patient was discharged on prostigmin 30 mg. and ephedrine sulfate 25 mg., both orally, three times a day.

The diagnosis of myasthenia gravis was quite definite. The symptoms were much improved for a few weeks with the medication prescribed. However, after a few weeks the drug lost its effect and hypodermic injections were begun. Finally, even these gave no relief of symptoms and the patient died about three months after his first visit to the hospital.

CASE 7.—A white man, aged 45, complained of drooping of the eyelids. The past health was excellent. For seven months the right eyelid dropped, and for five months there was similar difficulty with the left lid. The ptosis was not constant, was increased by activity, and was relieved by rest. He did not complain of diplopia.

There was moderate ptosis of both lids. The ocular movements were almost all lost, there being only slight deviation with strong effort. The neurologic examination was otherwise negative.

Electrical stimulation of the right sternomastoid muscle gave a normal response.

Prostigmin 1.5 mg. and atropine sulfate 0.6 mg. were injected subcutaneously. Within five minutes ptosis disappeared and the extra-ocular movements were fairly well performed.

The patient was treated for a year with ephedrine sulfate 25 mg. three times a day by mouth. There was little improvement or progression in the ocular muscle weakness. Weakness did not develop in other muscles.

This represents a case in which the clinical impression of myasthenia gravis was confirmed by the prostigmin test but not by electrical reactions. The stimulation was probably tried on a muscle not involved by the myasthenic process.

CASE 8.—A white man, aged 47, was admitted twice to the Johns Hopkins Hospital for muscular weakness. His past health was good. His first admission was from Feb. 18 to March 18, 1935. Four and a half years before, double vision and weakness of the left leg began and continued with varying severity. Since then the right eyelid had drooped and there had been generalized weakness increased by activity.

The general physical examination was negative. There was slight ptosis of the right eyelid. The left eye could not be adducted beyond the midline. The voice weaknened on counting 150 rapidly. Muscle strength in general was good, but the muscles tired easily. The clinical impression was myasthenia gravis, but there was some doubt about the diagnosis.

A myasthenic response was obtained on stimulation of the right sternomastoid muscle with the faradic current.

For a month after discharge he took aminoacetic acid and ephedrine without improvement. Muscular weakness increased so that he became bedridden, and he developed difficulty in swallowing and talking. On our advice he began taking prostigmin, 0.5 mg. subcutaneously each day. After an injection he stated that he could sit upright after fifteen to thirty minutes and felt much stronger for from two to three hours.

The second admission was from April 19 to May 14, 1936. At that time, in addition to the foregoing, there was bilateral partial ptosis and neither eye could be moved upward. There was diplopia in all fields. April 19, 1936, he was started on prostigmin 30 mg. by mouth three times a day. There was considerable increase in muscular power, so that he was able to sit up and eat without difficulty. For one day it was omitted and then he could not raise himself from bed. That day he was given subcutaneously prostigmin 1.5 mg. and atropine sulfate 0.6 mg. Within ten minutes he could raise himself from a supine to a sitting position, the ptosis disappeared, and there was much subjective improvement.

Since then he has continued on oral prostigmin. He has found it necessary to increase the dosage to 15 mg. from nine to ten times a day. If he exceeds 30 mg. at a dose, severe abdominal cramps result. If he omits a dose, muscular weakness renders him helpless. He has never been able to become ambulatory.

This represents a puzzling case in which the diagnosis of myasthenia gravis was strengthened by a positive reaction to prostigmin. Treatment with prostigmin orally undoubtedly caused much benefit, but the disease was of such severity that nontoxic doses brought about only partial relief.

CASE 9.—A white woman, aged 44, complained of weakness of the left side of the face and of the muscles of mastication, of about five months' duration. Her past health was excellent. When first seen, the only positive finding was slight weakness of the left facial muscles, involving especially the lower portion of the face. It was thought that she had a left peripheral facial palsy. The eye examination at that time was entirely normal. Five months later she returned complaining of drooping of the right eyelid, double vision and difficulty in swallowing, all increased by activity. At that time there was marked ptosis of the right lid and restriction of all extra-ocular movements. Faradic stimulation of the sternomastoid muscles gave definite myasthenic reactions.

Prostigmin 1.5 mg. and atropine sulfate 0.6 mg. were injected subcutaneously. Within five minutes the ptosis of the right lid disappeared and extra-ocular movements were well performed.

She was given ephedrine sulfate 25 mg. three times a day orally, and there was some subjective improvement. Because of a basal metabolic rate of —21, thyroid extract 32 mg. twice a day by mouth was administered, but there was no benefit from it. Prostigmin 30 mg. three times a day orally was then tried. It helped the chewing, swallowing and double vision, but its effects wore off in from two to three hours and the patient thought that the muscle weakness was worse then than before the drug was taken. During the time prostigmin was used she developed occasional regurgitation of liquids through the nose. However, in general there was improvement in muscle strength following the use of the drug.

The final series of cases represents a group of various neurologic and muscular disorders in which prostigmin was administered. These cases are recorded in the accompanying table.

Cases in Which Prostigmin Was Administered

Name	Age	Sex	Race	Diagnosis	Prostigmin	Result
M. S.	62	♀	White	Arteriosclerosis; left hemiplegia; N. VI palsy, left	1.5 mg.	Negative
A. L.	65	♂	Negro	N. VII, VIII, IX, XI, and XII rt. palsies	1.5 mg.	Negative
H. W.	26	♂	White	Myotonic dystrophy	1.5 mg.	Negative
R. B.	32	♂	White	Myotonic dystrophy	1.5 mg.	Negative
A. C.	29	♂	White	Alternating strabismus	1.5 mg.	Negative
S. G.	50	♂	Negro	Arteriosclerosis; N. VII palsy, left; hemiplegia, rt. N. VI palsy, left	1.5 mg.	Negative
M. P.	23	♀	White	Muscular dystrophy	1.5 mg.	Negative
G. G.	60	♀	White	Progressive bulbar palsy	0.5 mg. daily for 12 days	Negative
M. K.	18	♀	White	Retrobulbar neuritis; N. III, VI palsy, rt.; multiple sclerosis	1.5 mg.	Negative
C. H.	34	♂	White	Progressive muscular atrophy	1.5 mg.	Negative
C. L.	19	♂	Negro	Acute poliomyelitis with recent paralyses	1.5 mg.	Negative
P. B.	7	♂	Negro	Pseudohypertrophic muscular dystrophy	0.5 mg. for 100 days	Negative
G. M.	40	♂	White	N. VI palsy, rt.; multiple sclerosis	1.5 mg.	Negative

The difficulty in the diagnosis of myasthenia gravis is well illustrated by the following case:

CASE 5.—G. B., a white man, aged 36, married, a farmer, in the hospital from Nov. 19, 1934, to Jan. 20, 1935, had a negative family history, and the past history was excellent. Two years before entry he awakened one morning with a severe generalized headache, giddiness and nausea. He vomited copiously, had a bowel movement, suddenly became weak, and had to be carried to bed. He vomited repeatedly during the day and remained semiconscious. He was unable to open his right eyelid and saw double. After two weeks in bed he recovered sufficiently to be up and around. After that time there was persistent diplopia and impaired extra-ocular movements. There was no increase in the disability after the onset. Physical examination showed exophthalmos and bilateral ptosis, which was more marked on the right. The eyes could not be carried laterally beyond the midline. There was marked limitation of medial and upward movement and inability to move either eye down and laterally. The motion down and medially was good. There was an internal squint of the right eye. The visual fields were normal, and the visual acuity was good. The pupillary reactions were intact. The Wassermann reaction was negative. Roentgenograms of the skull were negative. Examinations of the spinal fluid, urine and blood revealed no abnormalities. The course was afebrile. On one occasion what was regarded as a myasthenic electrical reaction was obtained, but on two subsequent attempts this finding was not confirmed. He was given aminoacetic acid, from 10 to 20 Gm. daily, and ephedrine sulfate, 25 mg. three times a day. In about one month there was improvement of the ptosis. However, a marked squint and diplopia remained. He was seen from time to time and the same eye conditions were always found. Up to the present he had been doing heavy labor and no other myasthenic symptoms or signs had ever developed. May 1, 1935, he was given subcutaneously 1.5 mg. of prostigmin and 0.6 mg. of atropine sulfate. There were no objective changes in the eye signs and no subjective improvement within thirty minutes. He was then given 1 mg. more of prostigmin and after one hour there was still no change. November 1 the test was repeated with 2 mg. of prostigmin and 0.6 mg. of atropine sulfate subcutaneously with completely negative results.

At first it was thought that the patient had a ruptured aneurysm of the circle of Willis. Later, when the myasthenic electrical reaction was obtained, the possibility of myasthenia gravis had to be considered. However, the history of sudden onset accompanied by headache, vomiting and generalized weakness, the failure of development of further myasthenic signs, the complete absence of myasthenic symptoms, and the inability to confirm the electrical reactions threw doubt on that diagnosis. The final clinical impression was that the condition was the result of a bizarre form of encephalitis or of a rupture of a congenital aneurysm of the circle of Willis. Finally, the completely negative results with prostigmin furnish additional evidence that myasthenia gravis was not the cause of the illness.

COMMENT

The diagnosis of myasthenia gravis is in many instances a difficult one. In nine cases in which there was a fairly definite clinical picture the response to the injection of prostigmin was prompt and striking. In one case of doubtful diagnosis there was no response. If myasthenia gravis was present in this case it was in a state of remission. It is possible that the action of prostigmin is effective only during a period of exacerbation. In thirteen cases of other disorders in which muscular abnormalities or cranial nerve palsies were prominent features there was no response. Although this series is small, it suggests that immediate improvement following a single dose of prostigmin occurs only in myasthenia gravis. Consequently the use of this drug seems to be a valuable diagnostic test. Walker[1] suggests that in myasthenia gravis the supply of acetylcholine at the myoneural junction is deficient and that physostigmine and by analogy prostigmin, by delaying the destruction of acteylcholine, compensates for its lack. Pritchard[4] believes that defective innervation, whether resulting from some disability of the anterior horn cells or from impaired conduction of nerve fibers, should also be corrected by prostigmin. However, in this series this was not found to be the case.

The value of prostigmin as a therapeutic agent has not been definitely established.

The reports in the literature concerning the use of prostigmin in the treatment of myasthenia gravis are conflicting.

Laurent and Walker[9] have successfully treated cases with small doses of prostigmin given over long periods of time; e. g., 0.5 mg. two or three times daily given subcutaneously. Larger doses were used when more severe symptoms were present. They found that the fatigue after overexertion during the prostigmin effect tends to wear off and that small amounts of ephedrine were helpful in relieving it. No increase in the myasthenic symptoms resulted after the use of the drug in this manner over long periods of time. Wade,[10] Ver-

9. Laurent, L. P. E., and Walker, M. B.: Oral and Parenteral Administration of Prostigmin and Its Analogues in Myasthenia Gravis, Lancet **1**: 1457 (June 27) 1936.

10. Wade, H. J.: Treatment of Myasthenia Gravis, Lancet **1**: 1099 (May 30) 1936.

biest [11] and Kostakow [12] also obtained beneficial results by the daily subcutaneous administration of the drug.

Mitchell [13] found that the treatment of patients outside the hospital by this method was unsatisfactory and that better control of symptoms was obtained by oral administration. A similar view was expressed by Minski and Stokes.[14] Their ambulatory patients were treated with aminoacetic acid and ephedrine. Riven and Mason [15] have limited the use of prostigmin to combating the acute and dangerous manifestations of the disease. Hyland [16] states that the subcutaneous use of prostigmin is impracticable because of the temporary improvement and the method and cost of this means of administration.

The oral use of prostigmin has been found by most observers to be of distinct value. Everts [8] treated two cases for three months, and normal activity was restored in each one. Thirty milligrams given three times daily was found to be the optimum dose. Laurent and Walker [9] have also found that prostigmin is active orally. From 25 to 30 mg. gave a result comparable to the subcutaneous injection of 0.5 mg. They were able to obtain a supply of substance 36 of Aeschlimann and Reinert's [17] series, which was given in doses of from 100 to 200 mg. daily over long periods of time with good results. Improvement was first noted from forty to fifty minutes after taking the drug. The intensity of the reaction increases to a maximum at the end of two hours. It remains maximal for from six to eight hours, after which time the effect gradually wears off. They were not able to detect any increase in the myasthenic symptoms after several months of treatment. Mitchell [13] has treated nine cases of myasthenia gravis with prostigmin by mouth. In every case the improvement has been greater than on any previous medication, including ephedrine, aminoacetic acid and parenteral prostigmin. The average daily amount used was about 90 mg., which was given in from five to six doses. In all nine cases, potassium chloride was used as an adjuvant. In five cases it was thought to enhance the action of the prostigmin, but in the other four no difference was noted. Potassium chloride alone in doses of from 6 to 12 Gm. a day was first used by Laurent and Walther,[18] who found it to be of some value. Minski and Stokes [14] found it to be of no value in prolonging the effect of prostigmin and stated that its use resulted in a notable increase in toxic symptoms. Wade [10] came to the same conclusions.

In 1935 Denny-Brown [19] suggested the use of 20 minims (1.25 cc.) of tincture of belladonna by mouth, followed in twenty minutes by one-sixth grain (0.01 Gm.) of physostigmine salicylate in water, given once daily on an empty stomach. Hyland [16] tried this in several cases. In none was it beneficial and in four it was associated with an increase in symptoms and varying degrees of nausea.

In certain cases the use of prostigmin may be harmful. Hyland [16] noted that with each succeeding injection less benefit was observed, and weakness and fatigue of muscles became progressively worse after the effect of the drug had worn off. In case 4 of the present series each succeeding dose had less effect and the patient finally died of respiratory paralysis despite frequent subcutaneous injections of the drug. Laurent and Walker [9] state that the fatigue subsequent to the prostigmin effect eventually wears off.

In our experience the parenteral use of prostigmin has been quite helpful as a diagnostic test, and in the presence of an increase of symptoms such as frequently accompanies an infection of the upper respiratory tract. We have not attempted to treat patients by this method while they were outside the hospital.

Although the use of prostigmin by mouth is the most satisfactory treatment for these patients at the present time, the results in the present series of cases have not been as completely satisfactory as most of those previously reported. Patient 1 received the drug for eight months with striking improvement in her symptoms. However, the development of an infection of the upper respiratory tract necessitated the resumption of subcutaneous injections. Patient 8 has been taking the drug for eleven months. Definite benefit has resulted but the symptoms are so marked that even while taking 150 mg. of the drug a day he has not been able to be ambulatory. Patient 6 was greatly improved for a few weeks. Then the prostigmin lost its effect when taken orally and hypodermic injections were resumed. Patient 9 has had partial improvement over a period of two months, while patient 2 reported no decrease in the severity of his weakness after several weeks of 100 mg. daily.

Of unusual interest is case 1, in which a maculopapular rash simulating measles developed a short time before each serious exacerbation of the symptoms. A rash of similar description was noted by Rothbart [20] in one of his cases, but no other mention of it was found.

SUMMARY

1. The administration of prostigmin to nine patients with myasthenia gravis resulted in a striking immediate improvement in the signs and symptoms.

2. The administration of a single dose of prostigmin in fourteen cases of other neurologic and muscular disorders produced no immediate improvement.

3. Prostigmin seems to be of value in the diagnosis of myasthenia gravis.

4. The oral administration of prostigmin seems at present to be the most valuable therapeutic agent in the treatment of this disease, although some patients are not completely relieved of symptoms by its use.

11. Verbiest, H.: Behandeling met Prostigmine van een Patiënte, Lijdende aan Myasthenia Gravis, Nederl. tijdschr. v. Geneesk. **79:** 4372 (Sept. 14) 1935.

12. Kostakow, S.: Ueber klinische Beobachtungen bei Myasthenia Gravis mit Prostigmin (Roche), Deutsche med. Wchnschr. **62:** 296 (Feb. 21) 1936.

13. Mitchell, R. S. Experience with Oral Prostigmin Therapy in Myasthenia Gravis, New England J. Med. **216:** 96 (Jan. 21) 1937.

14. Minski, Louis, and Stokes, A. B.: Treatment of Myasthenia Gravis, Brit. M. J. **1:** 1095 (May 30) 1936.

15. Riven, S. S., and Mason, M. F.: The Treatment of Myasthenia Gravis, South. M. J. **30:** 181 (Feb.) 1937.

16. Hyland, H. H.: Myasthenia Gravis: Results of Treatment in Six Cases, Canad. M. A. J. **35:** 372 (Oct.) 1936.

17. Aeschlimann, J. A., and Reinert, Marc: The Pharmacological Action of Some Analogues of Physostigmine, J. Pharmacol. & Exper. Therap. **43:** 413 (Nov.) 1931.

18. Laurent, L. P. E., and Walther, W. W.: Influence of Large Doses of Potassium Chloride on Myasthenia Gravis, Lancet **1:** 1434 (June 22) 1935.

19. Denny-Brown, D.: Physostigmine and Belladonna by Mouth in Myasthenia Gravis, Lancet **1:** 767 (March 30) 1935.

20. Rothbart, H. B.: Myasthenia Gravis in Children, J. A. M. A. **108:** 715 (Feb. 27) 1937.

The Mystery of Life.—A great deal of cant is talked about the mystery of life, as if life were somehow more mysterious than the rest of Nature. When a man says that one fact of Nature is more wonderful than another, he is at fault. The striking of a match is every bit as wonderful as the working of a brain: the union of two atoms of hydrogen and one of oxygen in a molecule of water is every bit as wonderful as the growth of a child. Nature does not class her works in order of merit; everything is just as easy to her as everything else. —Paget, Stephen: Confessio Medici, New York, Macmillan Company, 1931.

MORTALITY FROM CESAREAN SECTION IN INDIANAPOLIS AND THE CENTRAL STATES

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Prior to 1929 no study had been made of the results of cesarean section in Indianapolis. In order to compare local work with that in other cities, and particularly with that in the larger maternity hospitals, I made a study of cesarean section in Indianapolis for the preceding year.

The statistics from the four Indianapolis hospitals from Nov. 1, 1927 to Nov. 1, 1928 are given in table 1.

These figures were significant in several ways. In the first place, although not as bad as in some other cities, a maternal mortality of 11.3 per cent was much too high. In each group of nine cesarean sections one mother had died.

TABLE 1.—*Statistics from Four Indianapolis Hospitals for One Year*

Hospital	Deliveries	Section	Maternal Deaths		Fetal Deaths		Incidence
			Number	Per Cent	Number	Per Cent	
A	741	45	6	13.3	6	13.3	1:16
B	631	29	5	17.2	1	3.4	1:21
C	487	26	1	3.8	2	7.6	1:18.6
D	174	6	0	0	0	0	1:29
	2,033	106	12	11.3	9	8.7	1:19

How much too high this local maternal death rate of 11.3 per cent was is apparent in view of a report published by the Chicago Lying-in Hospital at about the same time of 731 consecutive low cervical sections with a maternal death rate of 1.2 per cent.

eclamptic patients in Great Britain from 1911 to 1920, in which the maternal death rate had been 32 per cent.

The variation in maternal mortality among the four Indianapolis hospitals from 0 to 17.2 per cent and the variation in incidence of from one section in each twenty-nine deliveries to one in each sixteen deliveries was also significant.

The indications for operation as given on the hospital charts were lacking in many instances and were not convincing in many others. Also in about 95 per cent of the cases the classic technic had been used in spite of long labors, previous instrumentation and the like.

The results of this study were presented before the Indianapolis Medical Society with the hope that such a presentation and the resulting discussion would bring about a better understanding of the indications and contraindications for cesarean section as well as a substitution of a more modern technic, thereby decreasing maternal mortality in Indianapolis.

A similar study has recently been made of cesarean sections done in the same four Indianapolis hospitals for the years 1934 and 1935. The results are given in table 2.

It is apparent from these statistics that better obstetrics prevailed in Indianapolis in 1934 and 1935 than previously. A maternal mortality for cesarean section of 11.3 per cent in 1928 had fallen to 4.8 per cent in 1934 and to 3.2 per cent in 1935.

Several reasons can be given for this reduction in mortality.

First, the more widespread acceptance of the low cervical technic, the superiority of which is reflected by the 4.8 per cent maternal mortality against the 5.1 per cent mortality for the classic in 1934, and 1.8 per cent against 3.9 per cent for the classic operation in 1935.

Second, there were no sections done on convulsive eclamptic patients.

TABLE 2.—*Indianapolis Statistics for 1934 and 1935*

Hospital	Number of Deliveries	Low Cervical					Classic					Totals					
		Number	Morbidity	Maternal Deaths		Fetal Deaths		Number	Morbidity	Maternal Deaths		Fetal Deaths		Number of Sections	Incidence	Maternal Deaths		Fetal Deaths	
				Number	Per Cent	Number	Per Cent			Number	Per Cent	Number	Per Cent			Number	Per Cent	Number	Per Cent
								1934											
A	911	13	4	0	0	1	7.6	32	12	1	3.1	1	8.3	45	1:20	1	2.2	2	4.4
B	585	5	1	1	20	1	20	9	6	1	11	1	11	14	1:41	2	14	2	14
C	546	3	2	0	0	0	0	19	9	0	0	2	22.2	22	1:24	0	0	2	9
D	907	25	10	1	4	1	4	18	0	2	13.6	0	0	43	1:21	3	6.9	1	2
Totals	2,949	46	16	2	4.3	3	6.5	78	27	4	5.1	4	5.1	124	1:23	6	4.8	7	5.6
								1935											
A	1,055	21	11	0	0	2	9	52	15	1	1.9	3	5.7	73	1:14	1	1.3	5	6.9
B	640	2	1	0	0	1	50	4	4	1	25	1	25	6	1:106	1	16	2	33
C	584	4	2	0	0	0	0	27	15	2	7	4	14	31	1:18	2	6.4	4	12
D	913	27	20	1	5	0	0	19	11	0	0	1	0	46	1:19	1	2.1	0	0
Totals	3,192	54	34	1	1.8	3	5.5	102	45	4	3.9	9	8.8	156	1:20	5	3.2	12	7.6

This study also showed that of six eclamptic patients delivered by section in Indianapolis that year two had died, a maternal mortality of 33⅓ per cent. This high mortality was in keeping with that in Detroit of 42.7 per cent, as reported by Wertz, and Peterson's [1] study of 500 eclamptic patients delivered by section with a death rate of 34.8 per cent, and also with Erdley Holland's [2] classic review of cesarean mortality in

Third, I believe that the knowledge that cesarean section results were being studied each year for presentation before the local society was having a wholesome effect. General surgeons more frequently called for obstetric counsel before section was done. Also it was interesting to note from the charts that most of the sections during the years 1934 and 1935 had been done by the obstetrician instead of by the general surgeon as previously. I believe this last was responsible for the swing to the low cervical operation. However, it is

1. Peterson, R.: Publication of the Department of Obstetrics of Michigan.
2. Holland, Erdley: J. Obst. & Gynaec. Brit. Emp. **28**: 358, 1921.

a reflection on obstetric progress in Indianapolis that the classic operation outnumbered the safer lower cervical 78 to 46 in 1934 and 102 to 54 in 1935.

The comparative safety of the classic versus the low cervical technic is accurate only when comparison is made of the results of the two as done by the same surgeon or group of surgeons. Examples of such a comparison are given in table 3.[3]

Commenting on Maxwell's report, De Lee[4] says: "Again the immense superiority of the low incision is proved. How many times must it be proved before the old classical section is discarded?"

Dr. Louis E. Phaneuf[5] reports 358 transverse cervical cesarean sections with a maternal mortality of 1.9 per cent, with only one death in the last 160 cases.

Also in answer to a letter requesting his latest figures, Dr. Joseph B. De Lee answered, Jan. 17, 1936, as follows:

> We have had, from November 1914 up to date, 1,789 laparotrachelotomies with eighteen deaths. Of these deaths, ten might possibly be ascribed to the operation. The rest are medical deaths. During the same time, we have had 168 classic cesarean sections, with eleven deaths, of which two were ascribable to the operation. The mortalities are 1 per cent and 6.5 per cent respectively.

TABLE 3.—*Comparison of Safety of Classic versus Low Cervical Technic*

	Operation		Maternal Mortality, per Cent
1. Courtiss and Fisher	Classic	624	7.8
	Low cervical	376	1.3
2. Greenhill	Classic	147	4.76
	Low cervical	874	1.24
3. Quigley	Classic	104	1.92
	Low cervical	60	0
4. Maxwell	Classic	113	6.1
	Low cervical	165	0

The Indianapolis work as reported here is considered the first phase of this work. The second phase is the report of material received in answer to 200 questionnaires sent to members of the Central Association of Obstetricians and Gynecologists. This investigation was considered worth while because it would give a reasonably accurate cross section of work done in a large area of the United States and because it represented the work of men limiting their work to obstetrics and gynecology. Also it would furnish another standard with which to compare the Indianapolis work.

Two hundred of these questionnaires were sent out. One hundred and fifty-three replies were received, all of which were filled out completely down to the question asking for statistics of the operator's own cases. Sixty-three of the 153 reported these statistics. Therefore the results as tabulated are compiled from those numbers of returned questionnaires (table 4).

The answers need no comment down to the description of the technic of uterine closure. There were so many variations in this that tabulation or summation was impossible. In the classic technic, most men closed in three layers, the last one being a peritonealizing suture. There was about an equal division between interrupted and continuous sutures. The suture material ranged from plain number 1 catgut to twenty day chromic number 2 catgut.

In the low cervical technic most men reported a three layer closure. There was about an equal division as to the use of an interrupted or a continuous suture for the first row. Most men used a continuous suture for the second and third layers. There was a marked preference for twenty day chromic number 2 catgut with twenty day chromic number 1 next.

TABLE 4.—*Questionnaire with Replies*

What anesthetic do you prefer?			
Ether			31
N20+02			30
Ethylene			62
Spinal			10
Local			14
As preanesthetic medication, do you use?			
Morphine:	Yes		35
	No		73
Pentobarbital:	Yes		43
	No		4
Sodium amytal:	Yes		39
	No		36
Any other scopolamine			
When possible do you do low cervical instead of classic:	Yes		133
	No		18
If low cervical, do you prefer:	Longitudinal		114
	Transverse		19

Please describe briefly your technic of uterine closure as to number of layers, interrupted or continuous, and type of catgut used

Classic:
Low cervical:

Type closure of abdominal wall	Running	Interrupted	Type of Suture Material	
Peritoneal suture	144	1	Plain no. 1	63
			Plain no. 2	70
Fascial suture	47	8	Plain no. 2	
	78	17	Chromic no. 2	
Skin suture	76	18	Catgut	
	32	7	Silk	
Stay sutures	Yes 111	No 29		

If you have compiled any statistics as to your own cesarean section results, please fill in below

Type	Total Number	Number of Maternal Deaths	Fetal Deaths
Classic	1,504	43	30
Low cervical	3,889	33	106

The figures on closure of the abdominal wall need no comment except that the sum total of answers does not total 153 in every case, because all questions were not answered on all questionnaires.

The totals of sections reported of each kind with their accompanying mortalities are given in table 5.

TABLE 5.—*Central Association Statistics*

Type	Number	Maternal Deaths		Fetal Deaths	
		Number	Per Cent	Number	Per Cent
Classic	1,504	43	2.85	30	1.99
Low cervical	3,889	33	0.84	106	2.72
Totals	5,393	76	1.40	136	2.52

These totals include ninety-seven sections done by me, of which forty-six were of the classic type with four maternal deaths and fifty-one were of the low cervical type with no maternal deaths. There were no fetal deaths. The four maternal deaths among the classic group were due to the following causes: aspiration of vomitus after completion of anesthetic with asphyxia in five minutes; general peritonitis; coronary embolus; pulmonary embolus.

3. Courtiss, Movus, and Fisher, J. C. V.: Am. J. Obst. & Gynec. **23**: 679 (May) 1932. Greenhill, J. P., ibid. **19**: 613 (May) 1930. Quigley, J. K., ibid. **17**: 597 (April) 1929. Maxwell, A. F.: West. J. Surg. **42**: 14 (Jan.) 1934.

4. De Lee, J. B.: Year Book of Obstetrics and Gynecology, Chicago, Year Book Publishers, Inc., 1934.

5. Phaneuf, L. E.: Personal communication to the author.

SUMMARY

1. From Nov. 1, 1927, to Nov. 1, 1928, in four Indianapolis hospitals, the maternal mortality accompanying cesarean sections was 11.3 per cent.

2. In 1934 the mortality rate fell to 4.8 per cent. The rate for the classic technic was 5.1 per cent and for the low cervical it was 4.3 per cent.

3. In 1935 in the same four Indianapolis hospitals the maternal mortality decreased to 3.2 per cent, the rate for the classic operation being 3.9 per cent, while that for the low cervical was 1.8 per cent.

4. Data have been presented representing the cesarean section practice, preference and technic of 153 members of the Central States Association of Obstetricians and Gynecologists.

5. Sixty-three of these members reported 5,393 cesarean sections with a maternal mortality of 1.4 per cent and a fetal mortality of 2.52 per cent.

6. Of these 5,393 operations, 1,504 were classic cesarean sections with a maternal mortality of 2.85 per cent, and 3,889 were low cervical cesarean sections with a maternal mortality of 0.84 per cent.

7. It is apparent from a study of the Indianapolis work and that reported by the members of the Central States Association of Obstetricians and Gynecologists that the low cervical section is the operation of choice.

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THE ANTIGENIC PROPERTIES OF INSULIN

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The establishment of insulin as a complete and soluble protein [1] anticipated its property as an antigen. The allergic reactions that are often associated with its clinical use indicate that it is active in this respect. The greater prevalence of hypersensitivity to insulin preparations when they first began to be generally used as compared to substances now in use is probably to be attributed to the presence of extraneous substances that have for the most part been eliminated with the development of better processes of manufacture. Nevertheless reactions, both general and local, do still occur with the refined substances and present a baffling problem in the treatment of diabetes.

Commercial preparations of insulin are derived from either beef or pork tissues or indiscriminately from both. Studies of cases of hypersensitivity to insulin show that most of them are sensitive to the insulin protein itself, although some show sensitization to the protein of the species from which the insulin was prepared. Aside from their chemical importance these studies are of significance because of their bearing on the specificity of the insulin protein. The type of specificity of a given protein of animal origin is designated, first, by its immunologic relationship to other proteins of the same species and, secondly, by its immunologic relationship to the same protein of other species.

Barral and Roux [2] found that guinea-pigs sensitized with a saline extract of beef pancreas or with beef serum did not give anaphylactic reactions with commercial preparations of insulin; nor did insulin sensitized animals react with beef pancreas or with beef serum, although they did react with insulin. They concluded from these experiments that insulin was devoid of either organ or species specificity.

The present report includes a repetition of these experiments under more precise conditions, as well as additional ones planned to find the immunologic relationship of two insulins derived from different species of animals. The preparations used were beef insulin and pork insulin. While neither was actually crystalline material, they were "practically as pure as crystalline insulin." [3] Their activity is 20 units per milligram.

Virgin female guinea-pigs were sensitized with 1 mg. each of either of the two insulins, which was injected subcutaneously either in one single dose or in divided doses given over a period of twenty-four hours. The hypoglycemia that resulted was effectively controlled by administering a solution of dextrose by mouth before the injections were made and, at necessary intervals, subcutaneously and intraperitoneally. After a suitable incubation period the uteri of these animals were tested for anaphylactic sensitization with the Schultz-Dale technic.

REACTION OF UTERI SENSITIZED WITH BEEF INSULIN TO EXTRACTS OF BEEF PANCREAS, TO BEEF SERUM AND TO BEEF INSULIN

The extract of beef pancreas was made by grinding the fresh gland with saline solution in a mortar containing sand. The mixture was centrifugated and the supernatant fluid heated to 56 C. for one-half hour. The beef serum was similarly inactivated. Solutions of the insulins were prepared by dissolving them in a small amount of weak alkali, which was rapidly diluted with saline solution. The solutions were then adjusted as nearly as possible to a neutral reaction by adding dilute acid.

Uteri of guinea-pigs sensitized to beef insulin and suspended in the chamber of the Dale apparatus were exposed in turn to the extract of beef pancreas, beef serum and beef insulin. Chart 1 illustrates the type of reactions consistently obtained in this series of experiments. The tracings show that uteri sensitized with purified beef insulin reacted when exposed to this substance but did not react in the presence of beef pancreas protein or beef serum. These experiments indicate, like those of Barral and Roux, that the insulin protein, although obtained from the pancreas, was distinct from the bulk of the protein from this gland. An extract of pancreas must undoubtedly contain insulin protein but probably in such comparatively small quantities that its presence is not detectable with uteri sensitized to the insulin protein. The absence of reaction with beef serum, which is a strongly species specific antigen, shows that insulin is not species specific.

CROSS REACTIONS BETWEEN BEEF INSULIN AND PORK INSULIN

Virgin female guinea-pigs were sensitized with 1 mg. of beef insulin or with the same quantity of pork insulin. The uteri of these animals were tested for sensitization, first with the heterologous insulin and then with the homologous one. In each case there was an active contraction when the uterine strip was exposed to the insulin not used for sensitization. But

From the Otho S. A. Sprague Memorial Institute and the Department of Pathology, University of Chicago.

1. A review of the chemistry of insulin is given by Jensen, H.: Science **75**: 614 (June 10) 1932.

2. Barral, P., and Roux, J.: Compt. rend. Soc. de biol. **106**: 292 (Feb. 6) 1931.

3. These preparations were obtained from Eli Lilly & Co. through the courtesy of Dr. George H. A. Clowes, who vouches for their purity.

when complete desensitization was obtained to the heterologous protein there was still demonstrable in most instances a small amount of sensitization to the homologous protein. Typical of these experiments are the tracings shown in chart 2. There is, apparently, an antigenic activity in common between the two insulins, but there is also a residuum of specificity inherent to the species. It would appear that the chemical and immunologic properties of insulins are very closely related although, from these experiments, they are not completely identical.

These experimental facts are corroborated by certain clinical observations, although others do not bear them out. Tuft,[4] who reviews the literature on insulin hypersensitization reported prior to the publication of his article in 1928, cites a case in which severe generalized urticaria and marked subjective symptoms developed following injections of insulin, although previous daily injections over a period of a month or two gave no such reactions. Insulin had to be discontinued and the patient placed on a maintenance nonglycosuric diet. Skin tests made with commercial preparations of insulin from both pork and beef pancreas gave severe reactions, as also did purified recrystallized insulin protein (animal source not given). However, extracts of beef and pork meats gave no reactions. The patient's serum could convey the same type of sensitization to normal skin with the use of the Prausnitz-Küstner technic. Precipitins for crystallized insulin could be demonstrated in the patient's serum ten days after a generalized reaction, although complement fixing and anaphylactic sensitizing antibodies could not be detected. The precipitins disappeared by the fifth week after the reaction and the skin sensitizing properties of the serum disappeared by the fourth month, although the skin sensitivity of the patient was still present at that time. Grishaw[5] reports an instance of a patient who had local and general reactions with insulin from pork and also from beef, the two supplied by the same manufacturer. Another preparation from beef obtained from a second manufacturer also gave reactions, although a preparation from a third manufacturer, also obtained from beef, gave no reaction. Acetone, which precipitated the proteins and made the insulin inactive, removed the skin-reacting agent from the filtrate. Campbell, Gardiner and Scott[6] found that patients sensitive to commercial preparations of beef insulin are also sensitive to crystallized beef insulin.

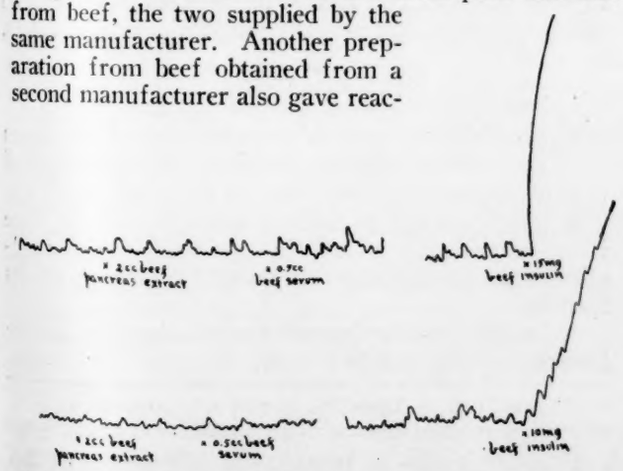

Chart 1.—Uterine tracings of guinea-pigs sensitized with 1 mg. of beef insulin.

4. Tuft, L.: Am. J. M. Sc. **176**: 707 (Nov.) 1928.
5. Grishaw, W. H.: Allergic Manifestation to Insulin, J. A. M. A. **97**: 1885 (Dec. 19) 1931.
6. Campbell, W. R.; Gardiner, W. J., and Scott, D. A.: J. Clin. Investigation **9**: 28 (Aug.) 1930.

The question has been raised whether insulins from different species are similar. Tuft[4] believes that it is another substance of immunologic specificity, since it has been shown that distinct hypersensitiveness to insulin protein irrespective of its biologic source can be present, whereas no sensitivity to the proteins of other tissues of the same animal could be demonstrated. In this respect insulin is similar to the lens protein, casein and the brain antigen. These facts are further in

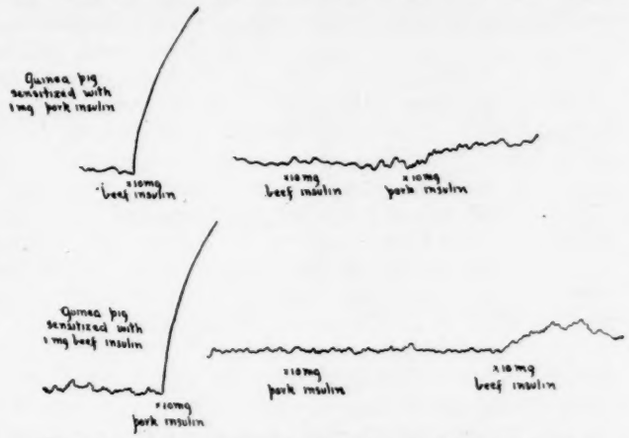
Guinea pig sensitized with 1 mg pork insulin
1 mg beef insulin
1 mg beef insulin
1 mg pork insulin
Guinea pig sensitized with 1 mg beef insulin
1 mg pork insulin
1 mg pork insulin
1 mg beef insulin

Chart 2.—Uterine tracings of guinea-pigs sensitized with insulin.

accordance with the statement of Wells[7] that substances of the body with a definite action and a product of cell activity with a given function to perform which is alike in all species, such as trypsin, epinephrine, thyroxine and insulin, should be similar for all species in contrast to the blood and tissue proteins, which have to do with the general metabolism of the species from which they come. Furthermore, chemical analyses of insulin crystals from various sources show a very close similarity in composition and structure. Scott,[8] however, points out certain discrepancies in the acceptance of the identity of all insulins. In the first place, Dingemanse[9] reports the production of a more powerful but amorphous insulin by adsorption and elution of the insulin, charcoal being used as the adsorbent, although these experiments have not been confirmed by other workers.[10] Secondly, Jensen and his co-workers[11] have reported a difference in the sulfur content of hog and beef crystallized insulin, but they admit that the difference may be due to impurities in the hog insulin. He finally points out the reports of patients sensitive to beef insulin who can be given hog insulin without reaction, and vice versa. It is probable that these cases were instances of sensitivity to contaminating proteins rather than to the insulin. Williams[12] reports two such cases showing gastro-intestinal symptoms when hog insulin was given but not reacting when beef insulin was given. Skin tests made with hog protein were positive but with beef protein were negative. Scott, however, does not bear out his criticisms in a comparison of crystalline insulins from the pancreas of ox, hog, sheep and fish. He found that the crystals from all sources had a similar microscopic appearance. Their solubility and iso-electric

7. Chemical Aspects of Immunity, New York, Chemical Catalogue Company, Inc., 1929, p. 72.
8. Scott, D. A.: J. Biol. Chem. **92**: 281 (July) 1931.
9. Dingemanse, E.: Arch. f. exper. Path. u. Pharmakol. (Verhandlungen der deutschen pharmakologischen Gesellschaft) **128**: 44, 1928.
10. du Vigneaud, V.; Geiling, E. M. K., and Eddy, C. A.: J. Pharmacol. & Exper. Therap. **33**: 497 (Aug.) 1928.
11. Jensen, H.; Wintersteiner, O., and Geiling, E. M. K.: J. Pharmacol. & Exper. Therap. **36**: 115 (May) 1929.
12. Williams, J. R.: A Second Case of Gastro-Intestinal Allergy Due to Insulin, J. A. M. A. **100**: 658 (March) 1933.

points appeared to be identical. There was a remarkable agreement in the unitage per milligram of solids. The results of chemical analyses for carbon, hydrogen, nitrogen and sulfur show a very close agreement with one another.

Bryce [13] tested a patient sensitive to insulin with three kinds of insulin, those from pork, beef and sheep, and found that they gave the same kind and size of local reactions. Extracts of pork and beef muscle gave no reactions. Hajek [14] discovered a patient who gave reactions to a commercial preparation of insulin that was apparently made from both beef and pork glands. When an insulin made from beef glands alone was given, no reaction followed. Neither were reactions obtained with extracts of muscle from mutton, lamb, pork, horse, goat and lobster. Karr, Kreidler, Scull and Petty,[15] in studying a case of insulin hypersensitivity, found that the subject they reported gave skin reactions to pork and beef insulins and to a crystalline insulin whose source is not given. The serum of the patient gave a precipitin reaction with an insulin, the type of which is also not mentioned. When this serum is mixed with insulin, the activity of the latter is not affected. A rabbit immunized with insulin produced a precipitating serum but only when the insulin used for immunization was injected, mixed with the patient's serum. Allan and Scherer [16] found during a period of about four years 161 cases of insulin hypersensitivity among 1,907 diabetic patients treated at the Mayo Clinic. Of these, 100 cases were studied as to the control of their reactions. In some instances reactions disappeared when the type of insulin was changed and in others they persisted when insulin of any source was used. The authors believe that in the former case the sensitivity was to contaminating proteins while in the latter the sensitivity was to the insulin protein. However, the patients thought to be sensitive to contaminating proteins did not react to other proteins, such as those of muscle derived from the same animal that provided the insulin. Although a patient may be sensitive to all types of insulin, owing to the presence of a hormonic characteristic protein, the authors believe that the human insulin protein is different from all other types, since they cannot conceive of a patient being sensitive to his own insulin.

Davidson [17] reports a case of diabetes in which a severe urticaria developed whenever insulin of any type, including pork insulin and crystallized insulin, was administered. Sammis [18] cites an instance of severe reaction in a nondiabetic patient given insulin because of underweight. Further tests showed the patient to be equally sensitive to beef insulin, sheep insulin and "synthetic" insulin.

If all insulins are chemically and therefore immunologically identical, the same question of iso-antigenicity arises as with other antigens of similar properties, such as lens protein, casein, brain, fibrinogen and thyroglobulin. If insulin from one species is identical with that of another species, a given animal should be able to form antibodies when injected with insulin from any and all sources, including that from the species of animal injected. This iso-antigenicity has been proved for all antigens for which there has been demonstrated a nonspecies specificity.[19] Similar experiments with insulin would in all probability give the same results. However, as with fibrinogen and thyroglobulin, a paradoxical situation is encountered in that insulin, in all probability an iso-antigenic substance like these other two proteins, occurs in the circulating blood, which is the condition *par excellence* for the formation of antibodies when ordinary antigens are used under experimental conditions. Yet, as with fibrinogen and thyroglobulin, there is no evidence that antibodies are formed under normal conditions.

Another striking and unexplained fact becomes evident and is discussed in a previous paper on the iso-antigenic properties of casein.[19] There are many thousands of people who receive daily injections of insulin preparations containing a protein capable of stimulating the formation of antibodies. Experimental animals receiving an antigenic protein under similar circumstances develop a high degree of sensitization, as manifested by severe local reactions as well as by general manifestations. Yet of all the people who are treated with insulin, even over long periods of time, only a comparatively few develop sensitization. There seems to be some other condition necessary than the parenteral introduction of antigen alone for the development of sensitization in man which is not necessary in lower animals. The mechanism that ordinarily protects a person from the dire results of repeated administration of an antigen appears to break down in allergic states. It is of interest to note that in a number of the cases of insulin hypersensitization this condition was present at the very first injection of insulin.

One may imagine that this failure of a protective mechanism which operates against the development of iso-antigenic activity might result in hypo-insulinism, deficiency of fibrinogen, the various disturbances of thyroid function, and mental diseases, as an expression of allergy to the corresponding iso-antigenic substances.

SUMMARY

1. Insulin protein is an active antigen.

2. Since insulin protein does not react in common with pancreas protein, its specificity is independent of that of the major constituents of the pancreas.

3. Insulin protein is without species specificity, since it has no antigenic activity in common with other proteins of the same species and which are strongly species specific.

4. Insulin proteins from different animal sources are immunologically closely related.

13. Bryce, L. M.: M. J. Australia **1**: 371 (March 25) 1933.
14. Hajek, Joseph: Local Insulin Reaction, J. A. M. A. **96**: 193 (Jan. 17) 1931.
15. Karr, W. G.; Kreidler, W. A.; Scull, C. W., and Petty, O. H.: Am. J. M. Sc. **181**: 293 (Feb.) 1931.
16. Allan, F. N., and Scherer, L. R.: Endocrinology **16**: 417 (July-Aug.) 1932.
17. Davidson, M. T.: J. Allergy **6**: 71 (Nov.) 1934.
18. Sammis, F. E.: J. Allergy **6**: 387 (May) 1935.
19. Lewis, J. H.: J. Infect. Dis. **55**: 168 (Sept.-Oct.) 1934.

A Scribbled Line of Remembrance.—Osler had the God-given quality not only of being a friend with all, high or low, child or grown-up, professor or pupil, don or scholar, but what is more, of holding such friendships with an unforgetting tenacity—a scribbled line of remembrance with a playful twist to it, a note of congratulation to some delighted youngster on his first publication, the gift of an unexpected book, an unsolicited donation for some worthy cause (and giving promptly he gave doubly), a telegram to bring cheer or consolation, an article to help a struggling journal to get a footing, a cable such as his last on the day of his operation to his old Hopkins friends, which was given by them to the press for the benefit of countless others who shared their own anxiety—all this was characteristic of the man whose first thoughts were invariably for others.—Cushing, Harvey: Consecratio Medici and Other Papers, Boston, Little, Brown & Co., 1928.

Clinical Notes, Suggestions and New Instruments

SUCCESSFUL TREATMENT OF TWO CASES OF FAMILIAL PERIODIC PARALYSIS WITH POTASSIUM CITRATE

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Familial periodic paralysis is a rare disease characterized by abrupt attacks of flaccid paralysis, without sensory loss or psychic disturbances of any sort, and from which recovery is complete. In about 80 per cent of cases the disease is hereditary. It is transmitted by both sexes, but males are affected twice as frequently as females. The etiology of the disease is unknown and postmortem examinations and biopsies have thrown no light on the condition.

The attacks may begin in childhood, but more often at puberty, and may be delayed until the age of 20 or 21. The onset is usually in the early morning and not uncommonly the patient awakes partially paralyzed, and complete paralysis develops. The muscles of the limbs are chiefly affected, the paralysis being as a rule symmetrical, but monoplegias and hemiplegias have been observed. The muscles concerned with speech, vision and deglutition usually escape, but the abdominal muscles are affected and, in severe cases, the respiratory muscles may become so weak that phonation, coughing and sneezing are impossible. The electrical excitability of the affected muscles to all currents is completely lost. Sphincter function is unimpaired, but retention of urine and feces during an attack is the rule. The reflexes are lost in the affected muscles.

The paralysis lasts from a few hours to three or four days, or even longer, and the attacks vary greatly in frequency, occurring every few days or separated by intervals of months or years. Schoenthal,[1] Singer and Goodbody,[2] Gardner[3] and Holtzapple[4] have given detailed descriptions and reviews of the literature.

The obscurity of the etiology of the disease is reflected in the variety of treatments that have been employed. This brief report details the apparently successful treatment of two brothers, suffering from familial periodic paralysis, with potassium citrate, a form of treatment which has been used before in this disease.[5]

The family history of the two brothers reveals that one maternal uncle and one female cousin suffered from attacks of periodic paralysis. The uncle died during an attack at the age of 35. The cousin is living at the age of 40 and is well except for an occasional minor attack of paralysis. Three siblings have never shown any symptoms whatever of periodic paralysis.

The past histories of both patients were completely noncontributory, and physical examinations revealed no evidence of organic disease.

CASE 1.—M. S., a man, aged 28, unmarried, a university student, began at the age of 14 to have attacks of weakness and slight paralysis of the extremities every few weeks. These attacks ceased during the summer only to return in the fall. At the age of 16 he began to suffer from paralytic attacks of greater severity, involving the trunk and all extremities. These major attacks of flaccid paralysis occurred at intervals of from one to three months. In between them he had many minor attacks, characterized by weakness of one arm or leg, which lasted for only a few hours. During the year before he began treatment with potassium citrate he was admitted to the hospital four times for attacks of major severity, lasting about two days. The minor and major attacks together seriously impaired his university work.

When examined three years ago, during an attack, all the muscles of the trunk, arms and legs were in a state of flaccid paralysis, with total areflexia. The examination was otherwise quite negative.

In June 1934 he began to take 5 Gm. of potassium citrate when the prodromal sensations of weakness and soreness of the muscles gave warning of an impending attack of paralysis. One dose of 5 Gm. would usually abort the attack but, if it progressed, he took 5 Gm. doses every hour until he felt strong again. Under this treatment no attack has progressed to complete paralysis, usually ceasing after a short period of weakness. During the past year he has not lost a single hour from his work as a student.

CASE 2.—E. S., a man, aged 31, a mechanic, brother of M. S., began at the age of 16 to have attacks of moderate weakness of the extremities and a few months later suffered from a major attack, with complete flaccid paralysis lasting forty-eight hours. He continued to have minor attacks, lasting a few hours, except during the summer, and then one year after the first major attack he had a second seizure, with complete paralysis of the muscles of the trunk and extremities. Since the age of 17 he has suffered severely from periodic paralysis, at times averaging a loss of two days a week from work. At one time he had a major attack, with complete paralysis, weekly for thirteen successive weeks.

In 1934 he began to take potassium citrate in 5 Gm. doses at the first sign of an attack, repeating the dose hourly if needed, and during the past two years he has been able to pursue his work as a mechanic without serious interruption. Now and then he suffers a few hours of muscle soreness and weakness, but these symptoms never proceed to complete paralysis as they did before he began treatment with potassium citrate.

The attacks of periodic paralysis are so irregular in their occurrence that neither brother has attempted to use potassium citrate prophylactically; they commence treatment only with the appearance of prodromal symptoms. Sodium citrate is totally ineffective in treating the attacks. The younger brother has used as much as 25 Gm. of potassium citrate in the space of six hours without harmful effect. Occasionally mild catharsis follows the use of several 5 Gm. doses.

SUMMARY

Potassium citrate has controlled the attacks of familial periodic paralysis in two brothers so well during the past two years that both have been restored to economic efficiency.

From the Department of Medicine, Duke University School of Medicine.

1. Schoenthal, Ludwig: Family Periodic Paralysis with a Review of the Literature, Am. J. Dis. Child. **48**: 799 (Oct.) 1934.
2. Singer, D. H., and Goodbody, F. W.: A Case of Familial Periodic Paralysis with a Critical Digest of the Literature, Brain **24**: 257, 1901.
3. Gardner, H. W.: A Case of Periodic Paralysis, Brain **35**: 243, 1912-1913.
4. Holtzapple, G. E.: Periodic Paralysis, J. A. M. A. **45**: 1224 (Oct. 21) 1905.
5. Mitchell, J. K.; Flexner, Simon, and Edsell, D. E.: A Brief Report of the Clinical, Physiological and Chemical Study of Three Cases of Familial Periodic Paralysis, Brain **25**: 109, 1902.

A NEW METHOD FOR OPENING A CARBUNCLE

CHARLES B. MABRY, M.D., JACKSONVILLE, FLA.

Not long ago I had a series of carbuncles, furuncles or old fashioned boils. Pain forcefully moved in and occupied my attention. A means of combat was sought and one finally found which was so successful that I have been asked to make this relief known.

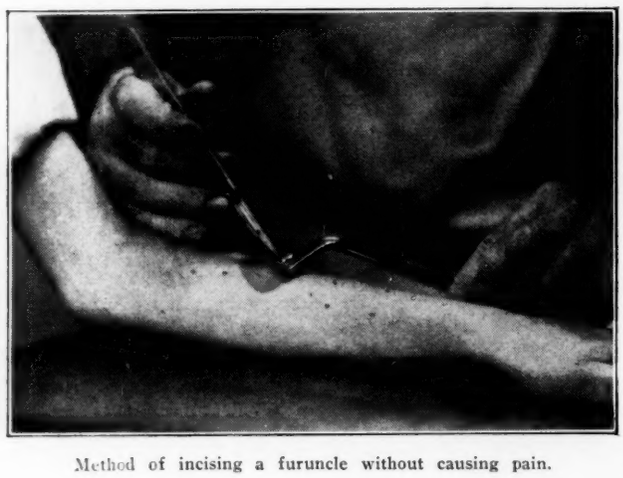
For many ages the primary reason for a large number of patients consulting a physician has been to seek relief from some form of pain. Much has been written and much more will be written on and because of pain. Its degree, its duration, its intensity, its location and its character have had and will continue to have marked effect on human behavior individually and collectively. In recent years new forms of anesthesia have been produced and many painful procedures have been robbed of their former agony.

A furuncle hurts. It hurts because the tension caused by forces combating the infection together with the infection form a firm, hard mass which presses on hypersensitive nerves. The slightest pressure on this indurated mass causes an alarming pain.

For a long time physicians have been deceiving themselves and their patients by freezing the furuncle with ethyl chloride before incising. We all know how little anesthesia has been accomplished, because the skin only has been anesthetized. It is impossible for the freezing to reach the depths of the indurated mass and anesthetize these deep indurated hypersensitive nerves, because the anesthesia is only a few millimeters deep. The freezing has made the skin tough to cut, so that it has been necessary to use additional pressure on the knife to make an

ample incision. The furuncle having been opened, the patient screams, turns pale, breaks out in a cold perspiration and then faints or vomits or both.

A new method which in my hands has been successful in making this hitherto agonizing procedure almost painless consists of only one new step. The furuncle is frozen as has always been done. A towel clamp now grasps the frozen skin and lifts it up or away from the body while the knife makes pressure



Method of incising a furuncle without causing pain.

inward. The inward pressure of the knife becomes a balancing or counteractive force against the towel hook. This prevents the deep pressure being made over the hard, inflamed hypersensitive mass and eliminates the pain, because the pain has always been caused by the knife pressure on the indurated mass and not by the cutting.

It is astonishing how little the patient is hurt. The furuncle having been drained, a dressing is applied in the usual manner.

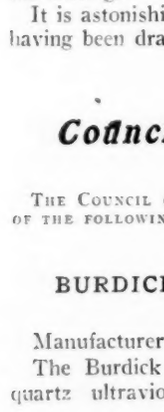
Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT. HOWARD A. CARTER, Secretary.

BURDICK LA-440 ULTRAVIOLET LAMP ACCEPTABLE

Manufacturer: The Burdick Corporation, Milton, Wis.

The Burdick LA-440 Ultraviolet Lamp is a high intensity quartz ultraviolet lamp for professional use. The burner, Uviarc Mercury Quartz type, is similar in construction to the burners used in other Burdick Ultraviolet Lamps. The electrodes are sealed in by graded fused seals. The burner does not need to be tilted when starting, but merely shaken slightly. It is available for either alternating or direct current. When operating on alternating current, it is self rectifying.



Burdick LA-440 Ultraviolet Lamp.

The reflector is chrominum plated and designed to distribute radiation over a treatment area approximately 2 by 6 feet at a distance of 3 feet. The reflector rotates and is adjustable to any position from horizontal to vertical.

The adjustable, counterbalanced 6 foot stand has a 30 inch vertical adjustment and a cross arm having a 25 inch extension with 10 inch adjustment. Moving parts have ball bearings.

The control unit is housed in a hexagonal metal cabinet and includes a meter indicating when the lamp is operating at full intensity. The unit is mounted on 3 inch solid rubber, ball bearing casters.

The ultraviolet radiation generated by this lamp is of a sufficient intensity to produce a first degree erythema on the average skin in a minute and a half at a distance of 30 inches.

The operating characteristics are as follows:

Alternating Current	*Direct Current*
Line voltage 105-125	Line voltage 105-125
Starting amperage on line 8.0	Starting amperage 6.6
Operating amperage on line 5.0	Operating amperage 3
Normal burner voltage across anodes 164	Maximum burner voltage 72
Operating watts from line 400	Starting burner voltage 18
Cathode burner operating amperage 4.6	
Maximum burner equivalent voltage 50	
Starting burner voltage 18	

The Burdick LA-440 Ultraviolet Lamp has the same burner and reflector as the Burdick Anniversary Model Ultraviolet Lamp, which was accepted by the Council (THE JOURNAL, Dec. 9, 1933, p. 1879). The difference lies in (*a*) the stand and control, the LA-440 having a 6 foot counterbalanced stand with a 30 inch vertical adjustment and a 25 inch cross arm with 10 inch adjustment; (*b*) a larger control cabinet, equipped with a meter to indicate when the lamp is at full intensity.

This lamp was investigated in a clinic acceptable to the Council for a period of three months. It was found to be satisfactory for the application of ultraviolet rays in clinical practice.

In view of the foregoing report, the Council voted to include the Burdick LA-440 Ultraviolet Lamp in its list of accepted devices.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. PAUL NICHOLAS LEECH, Secretary.

"SULFANILAMIDE" (THE COUNCIL NAME FOR PARA-AMINOBENZENE-SULFONAMIDE)

A number of pharmaceutical firms have submitted to the Council preparations of para-aminobenzenesulfonamide, which is not protected by patents. Among the proprietary names under which the product is marketed are Prontylin, Stramid, Streptocide, Colsulanyde and Prontosil Album. The Council on Pharmacy and Chemistry has not completed its consideration of para-aminobenzenesulfonamide and therefore has not issued any statement concerning the acceptability or nonacceptability of the product for inclusion in New and Nonofficial Remedies. However, considerable correspondence has been carried on between the Council and several firms with reference to a nonproprietary term for the preparation. One firm suggested the name "Sulfanilamide." Although the Council preferred a shorter term, a representative of this firm, which was the first to submit a nonproprietary product to the Council, pointed out that "Sulfanilamide" denoted the composition and that the name was being used abroad at the present time. Other interested concerns agree to the term. The Council has therefore formally adopted the nonproprietary name "Sulfanilamide" for para-aminobenzenesulfonamide.

RIBOFLAVIN, THE ACCEPTED NAME FOR VITAMIN B_2

Recently there has been submitted to the Council by Hoffmann-La Roche, Inc., a preparation termed Lactoflavin (Synthetic) "Roche." While this product was under consideration by the Council a communication was received from the chairman of the Committee on Vitamin Standards of the American Society of Biological Chemists in which occurred the following statements:

"There seems to be a fairly general agreement among investigators in the field of vitamins who have discussed this question of nomenclature that the name 'flavin' should be given to a water-soluble pigment that has been demonstrated to be necessary for the normal nutrition of the rat and for growing chicks (Lepkowsky and Jukes: *J. Biol. Chem.* **111**:119, 1935. Chick, Copping and Edgar: *Biochem. J.* **29**:721. György, Paul, *ibid.* **29**:741, 1935).

"Dr. H. C. Sherman has used the term 'vitamin G' for this substance and a number of continental European workers have used the term 'vitamin B_2', which was first suggested by Kuhn. English investigators use the term 'flavin.' At a conference of a group interested in this question of nomenclature during the session of the recent American Chemical Society meeting at Pittsburgh, the opinion was unanimous that the term 'flavin' should be used to designate this pigment and that the terms 'lactoflavin,' vitamin G, and 'vitamin B_2' should not be used. I am opposed to the use of the term 'lactoflavin' for a synthetic preparation, which obviously does not come from milk and which appears to have been first isolated from egg white. Ellinger and Koschara (*Ber.* **66**:315, 1933) reported in 1933 the isolation from whey of a substance which they called 'lyochrome' having the empirical formula $C_{35}H_{33}N_{32}$. Kuhn, György and Wagner-Jauregg (*Ber.* **66**:317, 1933) reported a few days later the isolation of a substance 'Ovoflavin' from egg white; but they proposed no formula. A short time later (*Ber.* **66**:576, 1933) the same authors proposed a formula $C_{17}H_{20}N_4O_6$ for this substance, reported decomp. point 265° and also stated that the absorption curve of the substance in water showed maxima at 360 and 440 Mu. Ellinger and Koschara (*Ber.* **66**:808, 1933) then reported the isolation of a substance which they called lactoflavin from whey having the empirical formula $C_{19}H_{18}O_{12}N_{14}$. Shortly thereafter Kuhn and his co-workers (*Ber.* **66**:1034) reported the isolation of a lactoflavin from milk having the same empirical formula as their previously isolated ovoflavin, melting with decomposition at 267°, and having an absorption curve 'extraordinarily similar' to ovoflavin. The structural formula of naturally occurring flavins has now been established beyond question and the empirical formula is in agreement with that assigned to ovoflavin by Kuhn. It appears therefore that a flavin was first isolated from egg white. Synthetic flavin, which was first prepared by Karrer (*Helv. chim. acta* **17**:1010, 1934) and Kuhn, Reinemund and Weygand (*Ber.* **67**:1460, 1934), has been shown to be chemically identical with flavin isolated from milk and to have the same biologic value for rats by von Euler, Karrer, Malmberg, Schopp, Benz, Becker and Frei (*Helv. chim. acta* **18**:522, 1935), who used the term "riboflavin."

"In assigning the name to the lactoflavin of Hoffmann-LaRoche, Inc., consideration must be given therefore not only to a suitable name for a commercial product but also the name of what is now recognized as being a chemically pure vitamin. The name should therefore be in as good agreement with current vitamin nomenclature as is practicable."

The Council's referee in charge of this product considered this communication and made the following comments:

"As to the suggestions of the chairman of the Committee on Vitamin Standards of the American Society of Biological Chemists, I agree that it would probably be desirable to omit the prefix 'lacto.' Personally, I would much prefer to get away from the implication that the compound is derived from a single source. As has been pointed out, the product was first isolated from egg white. The evidence is rather convincing that the flavins obtained from egg white, milk, liver, pancreas and a number of other sources are identical in structure and manifest the properties of vitamin B_2.

"It should be noted that the term flavin is used in the literature for a variety of synthetic products of similar structure, many of which manifest little or no vitamin activity. As far as I have been able to determine, any compound which contains the isoalloxazine nucleus is referred to in the literature as a flavin. Indeed, the term flavins represents a class of compounds, just as do the terms alcohols, ethers, alkaloids, etc. If 'flavin' without a prefix is preferred, perhaps the meaning could be safeguarded by stating that the term applies to the naturally occurring flavin, having the formula $C_{17}H_{20}N_4O_6$, and manifesting the physiological activity hitherto ascribed to vitamin B_2 or G. However, since flavin is a class name, I would prefer a suitable prefix. It seems to me that the compound might be referred to as d-Riboflavin or just Riboflavin. This would indicate that the compound hitherto denoted as vitamin B_2 is a ribose derivative of isoalloxazine. This would prevent confusion with many synthetic products also called flavins but which are devoid of ribose."

On recommendation of the Committee on Nomenclature, the Council concurred in these recommendations and voted that the product described as "6,7-dimethyl-9-d,1'-ribityl-isoalloxazin" shall be known as "Riboflavin," so far as products which come under the consideration of the Council are concerned.

The Council has not completed its consideration of Riboflavin "Roche" with a view of acceptance; when it is completed, the description of the product will appear in THE JOURNAL.

Council on Foods

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

FRANKLIN C. BING, Secretary.

HOUR GLASS BRAND TABLE SALT IODIZED

Manufacturer.—The Barton Salt Company, Hutchinson, Kan.

Description.—Table salt containing magnesium carbonate (1.0 per cent) as a caking inhibitor and potassium iodide (0.02 per cent).

Manufacture.—The salt brine, obtained by returning the water forced into the salt veins by means of drilled wells, is settled to remove turbidity, treated with lime and soda ash to remove the calcium and phosphates, and evaporated. The salt is washed, dried and screened. The magnesium carbonate and potassium iodide are added and the salt is packed in cartons.

Analysis (submitted by manufacturer).—Moisture 0.1%, matters insoluble in water 0.02%, calcium sulfate 0.39%, calcium chloride ($CaCl_2$) 0.02%, magnesium sulfate ($MgSO_4$) nil, magnesium chloride ($MgCl_2$) 0.03%, iron and aluminum oxides nil, sodium sulfate (Na_2SO_4) nil, sodium chloride (NaCl) 99.43 and potassium iodide (KI) 0.02%.

Claims of Manufacturer.—For all table and cooking uses. The iodine in the salt aids in preventing simple goiter caused by insufficient iodine in the diet.

(1) SEXTON BRAND GREEN BEANS, WATER PACKED
(2) SEXTON BRAND GOLDEN WAX BEANS, WATER PACKED

Manufacturer.—John Sexton & Company, Chicago.

Description.—(1) Canned green beans, packed in water. (2) Canned wax beans, packed in water.

Manufacture.—Green or wax beans are mechanically graded for size, hand sorted, washed, blanched, again washed and hand filled into cans. The cans are filled with hot water, sealed and heat processed.

Analyses (submitted by manufacturer).—(Analyses of entire contents including liquid): moisture 95.1%, total solids 4.9%, ash 0.41%, fat (ether extract) 0.7%, protein (N × 6.25) 1.0%, crude fiber 0.51%, carbohydrates other than crude fiber (by difference) 2.3%.

Calories.—0.19 per gram; 5 per ounce.

Claims of Manufacturer.—Choice quality beans packed in water without added sugar or salt. For use in special diets in which sugar or salt is proscribed or in quantitative diets of calculated composition.

RED AND WHITE BRAND FLOUR

Distributor.—Slocum Bergren & Wash Company, Minneapolis.

Manufacturer.—Blair Milling Company, Atchison, Kan.

Description.—A hard winter wheat "long patent" flour; bleached. The same as Blair's Certified Northern Type Flour (Bleached) (THE JOURNAL, Aug. 26, 1933, p. 675).

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SATURDAY, APRIL 17, 1937

GRADUATE TRAINING FOR PHYSICIANS

The education of a physician is not completed in the four years of the undergraduate curriculum. His development is a lifelong process, associated with unremitting toil and assiduous devotion to the most exacting of professions. As the frontiers of human knowledge advance, the slow and laborious progress of the pathfinder is superseded by modern means of advancement. When science displaces speculation, personal trial and error become too costly. In medicine the dissemination of new knowledge is as important as its acquisition. Our rapidly growing understanding of disease demands of the practitioner today a deeper knowledge than was available even a generation ago. Medical education has come to include graduate as well as undergraduate instruction. Examining boards in the medical specialties are requiring more fundamental and more comprehensive training of those who would be recognized as especially qualified in their several fields.

The situation, obviously, is more complicated than in undergraduate education, for the objectives and methods of graduate instruction in medicine are many and diverse. On the one hand are those who desire to fit themselves for the practice of specialties and, on the other, the large group of physicians already in practice who want to keep abreast of the latest advances in medicine. For the first group there must be provided systematic instruction in the specialties and the closely related medical sciences, as well as practical experience in the form of apprenticeships. Such apprenticeships nowadays are usually institutional rather than individual. The correlation and integration of these various types of experience is the practical problem that now confronts medical educators.

For the physician in practice, two main types of instruction must be provided: the systematic courses of the so-called postgraduate type, which can be offered only in the large cities where abundant clinical facilities are available, and the briefer programs of the university extension type, which are brought to the practitioner in his own or some nearby town. These do not involve any serious interruption of his work. Instruction of this character has been carried on successfully by a number of state societies, sometimes with the assistance of a university faculty or with support from one of the foundations.

An important difference in the economic status of the man just graduated and the physician who has been for a number of years in practice necessitates for each a widely different type of curriculum. The aspiring specialist who has just completed his internship frequently has no capital except his education. Often he is encumbered with financial obligations. For his further education he cannot pay in cash; he must pay in services. This he can easily do, for his time is not yet very valuable. Hence apprenticeships in which the student receives instruction and maintainance in return for his services as a resident or assistant are being developed. The physician who has built up a practice, however, has an economic value which does not permit him to spend long years in service in order to obtain the instruction which he needs but does permit him to pay reasonably for what he wants. His program must be systematically and intensively arranged so as to permit his speedy return to his own community.

The American Medical Association has published much information concerning opportunities for graduate training in medicine, but the rapidly increasing importance of this phase of education now makes necessary a more comprehensive investigation. Experience has shown that personal visits as well as official reports are needed in order to present a true picture of the activities of an educational institution. The Council on Medical Education and Hospitals, therefore, is now undertaking a survey of existing facilities for graduate study and advanced training in medicine. In this way it will be able to present to prospective students, to examining boards and to special societies reliable information concerning graduate medical education.

ACUTE BONE ATROPHY

In 1900 Sudeck [1] described acute bone atrophy developing in the course of a few weeks at the site of an injury or an inflammatory process or at a distance from it and presenting in a roentgenogram a characteristic picture of a patchy bone atrophy. This is accompanied by a rapid wasting of muscles and a corresponding weakness. In cases that arise on the basis of an inflammatory process, various vasomotor and trophic disturbances are to be observed. These include cyanosis, cold and clammy skin, desquamation, atrophy of skin and subcutaneous tissues and delayed healing of wounds. Shrinking of the joint capsule may occur and lead to ankylosis. This condition is not to be confused with atrophy of inactivity; it may indeed develop in a functioning extremity.

1. Sudeck, Paul: Deutsche med. Wchnschr. **28**: 170 (April 3) 1902; Die trophische Extremitätenstörung durch periphere Reize, Deutsche Ztschr. f. Chir. **234**: 596 (Oct.) 1931.

The pathogenesis of acute bone atrophy is to be seen in the irritating stimuli proceeding from the inflammatory focus as well as in reflex trophic processes. The acute bone atrophy was observed as a complication of a variety of acute and chronic inflammatory diseases of the bones, joints and tendons as well as in fractures, dislocations, contusions, chilblains and burns. In exceptional instances the dystrophic symptom complex may persist as an independent vasomotor disease after the original lesion has healed. Sudeck distinguishes three types of the condition: peripheral, caused by external irritation; neurogenic, caused by injury to the peripheral neuron, and the thrombophlebitic. The essential feature common to all three is the disturbed circulation with consequent impairment of tissue nutrition.

In his histologic studies of sixteen clinical cases of acute bone atrophy and in his animal experiments, Rieder [2] observed definite signs of a beginning bone absorption before the roentgenogram could reveal them. At this stage there was pronounced hyperemia of the blood vessels of the bone. Bone destruction was characterized by the presence of narrow spindle-shaped osteoclasts. The process of ossification was retarded. The narrowing of the trabeculae, the crowding of the lamellae and the calcium deprivation spoke for inadequate bone formation—bone dystrophy. Bone atrophy resulting from inactivity does not exhibit vasomotor or trophic disturbances. Rieder found that diminished blood supply does not play a part in the production of acute bone atrophy. Ligation of the nutritive arteries of the bone and of the arterial blood supply to the extremity did not affect the bony structure. Determination of the alkali reserve after the method of van Slyke revealed no constant alteration in carbon dioxide or lactic acid content of the venous blood. Determinations of blood calcium in the blood draining the area of artificially induced acute bone atrophy revealed a diminution. The rich sympathetic nerve fiber supply of the bony framework suggests the dominant rôle of the vasomotor system in the so-called massive atrophy of an extremity involving not only bones but the skin, subcutaneous tissues, tendons and synovial membranes.

All forms of acute bone atrophy develop as the result of disturbed circulation and altered local metabolism. These disturbances lead to the loss of balance between bone formation and bone absorption. The stimuli that cause dilatation of the blood vessels likewise cause an increase in osteoclasts.

The treatment of the condition is concerned primarily with the removal of the original lesion and the improvement of the circulation. This is accomplished in fractures by reduction and correct apposition of fragments and immobilization; in cases complicated with bloody extravasation and edema by elevation of the part. Circulation can be further aided by various physical therapeutic methods, such as alternating hot and cold immersions, rhythmic elevation and lowering of the limb, massage and heat. Cases refractory to conservative measures may be considerably improved by the operation of ramisectomy or sympathectomy.

2. Rieder, W.: Die akute Knockenatrophie, Deutsche Ztschr. f. Chir. **248**: 269 (Dec.) 1936.

POTASSIUM CHLORATE IN DENTIFRICES

Potassium chlorate has long been used as a constituent of mouth washes, gargles, dentifrices and extemporaneous preparations for oral conditions such as stomatitis and mercurial poisoning. Pharmacologic and therapeutic considerations have tended largely toward discrediting such usage. The exploitation of pharmaceutic products containing large amounts of this salt, particularly dentifrices and gargles, continues nevertheless with an apparent disregard of the possible hazards to health.

One dentifrice widely sold in the United States contains more than 41 per cent of this ingredient. In Austria a dentifrice containing more than 10 per cent of potassium chlorate cannot be sold without a physician's order. Reports have appeared pointing out the use of such a dentifrice for suicidal intent, and deaths have occurred when large quantities were swallowed. Much has been made of this fact by writers whose ostensible aim is to protect the public, but they have overlooked the fact that the ordinary daily use of such products does not entail the swallowing of large amounts. The Council on Dental Therapeutics will not accept any dentifrice for daily use which contains potassium chlorate.

A. P. Richardson [1] of the department of pharmacology of Stanford University School of Medicine recently reinvestigated the toxic potentialities of continued administration of chlorate for blood and tissues. In other words, Richardson attacked the problem from the more reasonable angle of chronic poisoning with potassium chlorate rather than from the angle of acute poisoning.

Richardson points out that prolonged use of products containing potassium chlorate, which is a not uncommon practice, might result in sufficient absorption of chlorate, particularly when aided by frictional devices, local lesions, such as ulcers and pus pockets, and other inflammatory states, to produce injurious effects on the blood, kidneys, liver and general health. The administration of potassium chlorate has been a common practice in physiologic laboratories to produce damage to the kidneys.

One of the criteria in the past has been that potassium chlorate formed methemoglobin. Richardson found, however, that continued drinking and repeated intramuscular injections of potassium chlorate in doses larger than those which might be absorbed into the system from ordinary usage of preparations containing

1. Richardson, A. P.: J. Pharmacol. & Exper. Therap. **60**: 101 (Jan.) 1937.

this salt failed to produce demonstrable methemoglobinemia, although considerable illness, loss of body weight and wasting of tissues were produced. This is consistant with a slow and inefficient direct action of chlorate on human blood in vitro, in which the production of methemoglobin required first a hemolysis or some corpuscular injury. Accordingly, methemoglobinemia is not the first, or an important, phenomenon in chlorate toxicity except just before death or post mortem. This fact may have a bearing in forensic toxicology.

Whereas sodium chlorate produced the same changes as potassium chlorate, sodium chloride did not cause visceral degeneration, thus indicating a specific action due to the chlorate ion and not to the potassium ion, as postulated by previous workers.[2]

Even though the test animals survived larger amounts of potassium chlorate than is apt to be absorbed, Richardson points out that the traditional use of potassium chlorate in oral preparations lacks a rational or scientific basis. High concentrations locally may produce protoplasmic injury, as indicated by the slowing down of ciliary activity on strips of frog's esophagus. This salt, Richardson therefore concludes, has no real place in the cosmetic armamentarium. A salt action, when desired, may be obtained with ordinary sodium chloride, which can be used virtually with impunity. The inclusion of potassium chlorate in the current edition of the Pharmacopeia deserves to be reconsidered in the light of these experiments.

AMINO ACIDS AS LIMITING FACTORS IN MALIGNANT GROWTHS

The importance of certain dietary essentials for normal nutrition and growth is well established. As the phenomenon of growth is characterized by a rapid synthesis of body tissue, the need for dietary protein as raw material for this synthesis is apparent. More specifically, the demand for exogenous nitrogen for the building of cellular protoplasm is a manifestation of the need for the individual amino acids, which comprise dietary protein and which are made available to the organism by the processes of digestion and absorption. The pioneer work of Osborne and Mendel clearly demonstrated that, while the body is capable of synthesizing most of these amino acids, this is not true of a certain number of these compounds which must be supplied in the diet and which therefore were termed by those investigators "essential amino acids." Our present knowledge of the rôle of the amino acids in nutrition and growth indicates that nine of the known components of the protein molecule cannot under normal conditions be synthesized by the organism and must be supplied in the diet in order that good nutrition may be maintained and normal growth take place.

2. Ulrich, J. L., and Shternov, V. A.: J. Pharmacol. & Exper. Therap. **35**: 1 (Jan.) 1929.

In view of the fact that there are some amino acids which are essential for the proliferation of normal tissues, the question arises whether these nitrogenous substances are also essential for the proliferation of malignant tissues. This question is of interest and importance because by a determination of the nature of the various chemical factors that are involved in the normal, continual synthesis of cell proteins it may be possible to secure information that will permit control of the growth of neoplasms. In other words, by restricting a diet with respect to a factor that is essential for normal tissue growth, it may be possible to inhibit neoplastic growth. This important problem is being studied in detail in the Division of Pharmacology of the National Institute of Health, United States Public Health Service, and several interesting reports of some of the investigations are now available.[1] As the indispensability of lysine for normal growth has been definitely established, and since an artificial diet deficient in lysine is fairly simple to prepare, the capacity of this amino acid to limit malignant growth has been investigated. A strain of mice was chosen which exhibits spontaneous neoplasms, since results obtained with this type of growth appear to be of greater significance than those obtained with transplanted tumors. The growth rate of each tumor was determined by estimating the cross sectional area in square millimeters from two dimensions of the tumor, the measurements being made twice weekly. At the end of the experiments a careful necropsy was made; routine histologic examination of the tumor also was conducted. All the tumors in the investigations reported were mammary carcinomas of varying histologic structure. It was clearly demonstrated that, on an adequate stock diet, normal growth of young rats occurred and that on the same diet there was rapid growth of spontaneous mammary carcinoma in mice. However, when the diet was rendered deficient in lysine by subjecting the milk powder of the diet to heat under specified conditions, normal body weight gains and malignant growth were greatly inhibited. The same inhibition of normal growth of young mice and the growth of mammary carcinoma in adult mice could be inhibited by a diet in which gliadin, a protein low in lysine, was the sole source of protein. Furthermore, the addition of lysine to either type of diet resulted in a prompt response in both normal and malignant growth. It seems evident from these studies that lysine in utilizable form is an essential factor necessary for the growth of the mammary carcinoma.

More recently, these results have been extended to other essential amino acids.[2] The indicated importance of glutathione as a factor influencing the proliferation of cells and the activity of certain cellular enzymes

1. Voegtlin, Carl, and Thompson, J. W.: Pub. Health Rep. **51**: 1429 (Oct. 16) 1936. Voegtlin, Carl and Maver, Mary E., ibid. **51**: 1436 (Oct. 16) 1936.

2. Voegtlin, Carl; Johnson, J. M., and Thompson, J. W.: Pub. Health Rep. **51**: 1689 (Dec. 4) 1936.

led to a consideration of whether or not, under certain conditions, glutathione can influence the proliferation of neoplasms. As glutathione is a tripeptide composed of cystine, glutamic acid and aminoacetic acid (glycine), and since a diet deficient in cystine and methionine does not permit normal growth of young rats, the Washington investigators have first studied the problem of whether neoplastic growth can be inhibited by feeding adult animals with tumor on a diet deficient in cystine and methionine. It was demonstrated that it is possible by this type of diet to cause a slowing or even cessation of the growth of a typical neoplasm. The same diet inhibits the normal growth of young mice. Furthermore, it was shown that following a period of inhibited tumor growth the administration of either cystine or glutathione causes a marked stimulation of tumor growth. It would seem, therefore, that with respect to the growth-stimulating response to cystine or glutathione there is no essential difference between normal growth of young mice and rats on the one hand and the growth of the spontaneous mammary carcinoma on the other. Although a more detailed study, with perhaps statistical treatment of the data, is desirable, evidence appears to be accumulating which indicates that the proliferation of this typical malignant tumor can be inhibited by diets deficient in certain essential amino acids. It will be of interest to determine whether other types of malignant tumors, especially those induced by carcinogenic substances, behave similarly.

Current Comment

THE EFFECT OF THEELIN ON BLEEDING IN NONHEMOPHILIC PATIENTS

In previous discussions of the use of estrogens in the treatment of hemophilia in these columns [1] it has been pointed out that, although they appeared to be of some value in some instances, the results have been negative in the majority of cases thus far described. Recently the effect of theelin on hemorrhage in four nonhemophilic patients has been studied.[2] Two of the patients were boys aged 3 and 12 years, one was a man aged 32, and one was a woman aged 39. There was no history indicative of hemophilia in any case and the clotting time of each patient was normal prior to operation: tonsillectomy in three cases, and both tonsillectomy and adenoidectomy in the other. After periods of from ten hours to six days following the operation, however, there occurred bleeding of a diffuse capillary oozing type, which could not be controlled by the usual means. Treatment with theelin was then tried and the result in the four cases was rather striking. Within twenty to thirty-five minutes after the subcutaneous injection of from 25 to 50 rat units of theelin, bleeding ceased and did not recur. Although these observations are indeed suggestive, further careful studies in a larger number of subjects is needed before conclusions are warranted regarding the possible favorable effect of estrogens in the treatment of hemorrhage in nonhemophilic patients.

1. Hormones in the Treatment of Hemophilia, Current Comment, J. A. M. A. **104**: 1422 (April 20) 1935.
2. Heinberg, C. J.: Treatment of Hemorrhage in Nonhemophilic Patients with an Estrogenic Substance, Arch. Otolaryng. **24**: 758 (Dec.) 1936.

A COMPLICATION FOLLOWING TREATMENT WITH SULFANILAMIDE

With the introduction into therapeutics of a new drug that produces spectacular results there may be disadvantages that do not become obvious until after the drug has been in use for some time. Experiences with dinitrophenol, beta-aminopropylbenzene, cinchophen and mandelic acid will be remembered. While sulfanilamide at first was believed to be nontoxic, several reports now indicate that sulfhemoglobinemia may be an occasional complication of its use in treatment. Discombe [1] at St. Bartholemew's Hospital, London, calls attention to this in six of seven patients in the hospital who had received more than 5 Gm. of the prontylin brand of sulfanilamide. Three of these patients showed marked cyanosis. The cyanosis which is caused by sulfhemoglobin may be spectacular and alarming, but it does not produce any serious consequences if the drug is stopped as soon as it is noticed. All of the six patients so affected were recovering at the time of Discombe's report. If, however, the total hemoglobin in a case complicated by sulfhemoglobinemia should fall below about 30 per cent (by the Haldane scale), the condition might be dangerous. Cyanosis probably could not occur then; and yet the drug responsible for the sulfhemoglobinemia might be continued until over half of the total hemoglobin present in the patient's blood was changed to the inert form. Under such circumstances, the plight of a patient suffering from a streptococcic infection whose active hemoglobin amounted to about 15 per cent would be hazardous. An interesting fact is that four of the seven patients had been given frequent doses of magnesium sulfate. Another patient had been given two doses of magnesium sulfate, and another received no magnesium sulfate by mouth but did have dressings of sodium sulfate applied to a large gangrenous area. The one patient who did not show any abnormal pigments in the blood even after long continued sulfanilamide treatment had not received any sulfates by mouth or as a dressing. It has been suggested that some connection exists between the development of sulfhemoglobinemia and the use of magnesium sulfate in patients who are under treatment with sulfanilamide; as yet this can neither be confirmed nor denied. Discombe's report suggests that a careful watch for the development of cyanosis is not sufficient precaution against sulfhemoglobinemia; in addition the total hemoglobin should be determined and the patient's blood examined at regular intervals of every few days. The possibility of an unrecognized occurrence of sulfhemoglobinemia should be borne in mind and the administration of magnesium or sodium sulfate to patients under treatment with sulfanilamide probably should be forbidden until more information is available.

1. Discombe, George: Sulfhemoglobinemia Following Sulfanilamide Treatment, Lancet **1**: 626 (March 13) 1937.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Medical Conference. — A medical conference for general practitioners was held in Oakland recently under the auspices of the Alameda County Institutions Commission, the Alameda County Medical Association, staffs of hospitals in Alameda County and the University of California Extension Division, with Dr. Benjamin W. Black in charge. The program was designed to cover the specialties for the general practitioner.

Hospital News.—The East Bay Hospital Conference, composed of all approved hospitals in Alameda County, held its annual meeting recently at Peralta Hospital, Oakland. The speakers included Drs. Robert T. Legge, Berkeley, on "Control of Venereal Disease," and Benjamin W. Black, Berkeley, "Relationship of the County Hospital to the Voluntary Hospitals." —— The Seaside Hospital of Long Beach, Ltd., through the action of its stockholders and board of directors, has changed its corporate status and its name. Henceforth it will be operated as a nonprofit institution, governed by a board of trustees and using the name "Seaside Memorial Hospital."

COLORADO

Spring Clinics.—The Pueblo County Medical Society will conduct its fourth annual spring clinics in Pueblo, May 5-7, under the auspices of the Colorado State Medical Society. The program will include symposiums on syphilis, respiratory diseases of childhood, peptic ulcer and gallbladder. The guest speakers will include Dr. Delmar Foster Bice, Yakima, Wash., on "State Medicine," and Dr. Bradford James Murphy, Colorado Springs, "Mental Hygiene." Other speakers will include the following, all of Pueblo:

Dr. Earle H. Corry, Exfoliative Dermatitis Following Eczema.
Dr. Joseph W. Craighead, The Cardiac Problem.
Dr. Clarence E. Earnest, The Handling of Eye Injuries.
Dr. Scott A. Gale, Treatment of Gynecologic Conditions by Elliott Treatment.
Dr. Harold T. Low, Paralytic Bladder in Spinal Cord Injuries.
Dr. William Senger, Advances in the Treatment of Inguinal Hernia.

CONNECTICUT

Twenty-Five Years' Service.—Dr. Charles J. Bartlett has retired as a commissioner of the New Haven Board of Health after twenty-five years' service, according to *Health*, the department's monthly bulletin. The February issue was dedicated to safe milk, which has been Dr. Bartlett's chief interest during his association with the board. Aged 72, Dr. Bartlett graduated from Yale University School of Medicine in 1895. He is emeritus professor of pathology at his alma mater. In 1918 he was president of the Connecticut State Medical Society and in 1935 of the Connecticut Medical Examining Board and the Connecticut Association of Public Health and Clinical Laboratories. He will continue to serve the board as consultant.

DELAWARE

Society News.—Dr. Eldridge L. Eliason, professor of clinical surgery, University of Pennsylvania School of Medicine, Philadelphia, addressed the New Castle County Medical Society at the Delaware Academy of Medicine, Wilmington, March 16, on the gallbladder.

DISTRICT OF COLUMBIA

Prize to Dr. du Vigneaud.—Vincent du Vigneaud, Ph.D., professor of biochemistry, George Washington University School of Medicine, has received the Hillebrand prize for 1936 of the Chemical Society of Washington. The award, which was presented March 11, was made in recognition of Dr. du Vigneaud's contributions to the chemistry of biologically significant sulfur compounds.

Society News.—The Medical Society of the District of Columbia, Washington, was addressed April 14 by Drs. George B. Trible on "Nose and Throat Manifestations in the Acute Infections of the Mononucleosis Type" and Ralph M. LeComte, "Renal Tuberculosis." —— Sir Henry H. Dale, London, will address the Academy of Medicine of Washington, May 18, on the chemical transmission of the nerve impulse. The academy adopted a resolution, March 9, in memory of the late Dr. William A. White, who was the first president of the academy.

ILLINOIS

Society News. — Dr. Francis E. Senear, Chicago, will address the Adams County Medical Society, May 10, in Quincy on "Diagnosis and Treatment of Early Syphilis." A symposium on intravenous medication was presented before the society April 12 by Drs. Milton E. Bitter, James F. Merritt, Warren F. Pearce and Walter M. Whitaker, all of Quincy.—— Dr. John J. Hammond, St. Louis, discussed pneumonia before the Madison County Medical Society in Highland, April 2.

Chicago

Dr. Harmon to Direct Program for Crippled Children. —Dr. Paul H. Harmon, instructor in orthopedic surgery, University of Chicago, has been appointed director of the crippled children's bureau of the Illinois Department of Public Welfare, with offices in Springfield, effective April 1. The university has granted Dr. Harmon a leave of absence to organize the state's program for crippled children, which will be financed by social security funds. The project will include a census of crippled children; provision for the care of indigent crippled children, and an orthopedic field nursing and follow-up program.

Rongetti Denied Freedom.—Dr. Amante Rongetti, who is serving sentence for manslaughter in the state prison at Joliet, was denied a writ of habeas corpus by Judge Edwin L. Wilson of the Will County circuit court at Joliet, March 25, it is reported. Dr. Rongetti was received at the penitentiary Feb. 10, 1934. In his first trial, on the charge of causing a death through an illegal operation, Rongetti was sentenced to death, but at the second trial the supreme court committed him to the penitentiary for from one to fourteen years. Feb. 6, 1934, a few days before his entry into Joliet, Rongetti completed a three year sentence in the federal prison at Leavenworth, Kan., for violation of the Harrison Narcotic Act.

Society News. — The Chicago Urological Society was addressed March 25, among others, by Dr. Harry E. Kasten, Beloit, Wis., on "Metastasis in Hypernephroma." Dr. Homer G. Hamer, Indianapolis, will address the society, April 22, on "Diagnosis, Differential Diagnosis and Treatment of Metastatic Infections of the Kidney" and Dr. Vincent J. O'Conor will discuss the etiology of the subject.——The Chicago Gynecological Society was addressed, March 19, among others, by Drs. George C. Finola on "Bone Changes in the Fetus Following the Administration of Dicalcium Phosphate and Viosterol to the Pregnant Mother," and Morris Edward Davis and Sarah A. Pearl, "Biology of the Human Vagina During Pregnancy."——Dr. Edward A. Skolnik addressed the Jewish Physicians Fellowship Club of Chicago and Suburbs March 8 on "A Panoramic View of Syphilis."——The Chicago Orthopaedic Society was addressed, April 9, by Drs. Harry E. Thompson, Tucson, Ariz., on "Chronic Atrophic Arthritis," and Sumner L. S. Koch, "Infections of the Hand in a General Hospital."

INDIANA

Personal.—Dr. Verne K. Harvey, Indianapolis, has been reappointed director of the Indiana State Board of Health.

Child Health Day.—An organization has been perfected in Indiana to carry out a uniform observance of Child Health Day, May 1. The program chairmen of the county medical societies will draw up programs in cooperation with the Indiana Advisory Health Council, the medical association and the state board of health. The work will be coordinated through newspaper publicity, clinics and school health and radio programs, the state medical journal announces.

Maternal Mortality.—The Indiana State Board of Health early in March launched a campaign to reduce maternal mortality, the work to be financed with funds recently made available under the social security act. The bureau of child and maternal health, which will supervise the project, was created last year with Dr. Howard B. Mettel, Indianapolis, as director. According to the state board's bulletin, in Indiana during the last five years 4,000 women were unattended by physicians at childbirth.

IOWA

Plan for Syphilis Control.—The committee on venereal disease control of the Iowa State Medical Society and the state board of health formulated plans for the state's participation in the national campaign against syphilis at a meeting January 17. The program will include the establishment of clinics for patients unable to pay for private treatment, and

the development of an adequate follow-up nursing service. One phase of the plan became effective February 1, when approved arsenicals and bismuth preparations were made available on request, in minimum doses of twenty each, to patients in the acute infectious stage. After July 1 it will be possible to provide drugs required for adequate treatment of all cases of syphilis, irrespective of economic status, without cost, on request of the attending physician. Pending favorable legislation, it was thought that by April 1 a statewide free laboratory diagnostic service would be available. The plan provides for the distribution of antisyphilitic drugs through local druggists on a carrying charge of 10 per cent.

KANSAS

Society News.—Dr. Claude S. Beck, Cleveland, discussed "Recent Advances in Cardiac Surgery" before the Wyandotte County Medical Society, Kansas City, March 16. The society was addressed March 2 by Drs. William W. Abrams, Kansas City, on "Epilepsy and Its Treatment" and Paul M. Krall, Kansas City, "Physiologic Considerations and Their Possible Relationship to Cardiovascular Disorders."

Medical Service Bureau an Experiment.—The Sedgwick County Medical Society and the Wichita Community Chest have set up, as an experiment, a medical service bureau which will be located in the offices of the county society. Control will be vested in a board of six members, three from the society and three from the Community Chest. The latter has contributed $1,000 for the services of a case worker and the medical society is furnishing equipment and office space. According to the *Medical Bulletin*, the patient referred to the bureau by either a physician or a recognized social agency will be interviewed by the case worker, who, after a study of the patient's income and his budget requirements, will determine the amount he can pay for medical services over a twelve months period. A report will be given to the physician chosen by the patient and he in turn will arrange a satisfactory fee and plan of payment. The experiment will be conducted for eight months.

LOUISIANA

State Medical Meeting at Monroe, April 26-28.—The annual meeting of the Louisiana State Medical Society will be held in Monroe, April 26-28, under the presidency of Dr. Hiram W. Kostmayer, New Orleans. The public is invited to the meeting of the section on public health and sanitation, when Sir Aldo Castellani will discuss "Preventive Aspects of Medical Service Among the Italian Forces in the Ethiopian War." Guest speakers will include:

Dr. Warren H. Cole, Chicago, Acute Pancreatitis.
Dr. Jean Paul Pratt, Detroit, Pelvic Conditions Simulating Appendicitis.
Dr. Ernest Sachs, St. Louis, Surgery in Brain Tumors.
Dr. Melvin S. Henderson, Rochester, Minn., Internal Fixation and Fractures of the Neck of the Femur.
Dr. Andrew B. Rivers, Rochester, Minn., The Cause of Dyspepsia at Various Ages.
Dr. Reuben A. Brown, Montgomery, Ala., A Practical Tuberculosis Case Finding Program.

MASSACHUSETTS

University News.—Dr. Henry E. Sigerist, Baltimore, discussed "The Rôle of the Professional Organization in Social Action" before the Boston University Medical Society, March 29.——At a meeting of the Harvard Medical Society in Boston, April 6, Dr. Albert Bessemans, former rector of the University of Ghent, Belgium, spoke on "The Invisible Form of the Syphilitic Virus."——Dr. Louise Eisenhardt, research assistant in pathology, Yale University School of Medicine, New Haven, delivered the annual alumni lecture at Tufts College Medical School, Boston, April 6; her subject was "Observations upon Patients After Operation for Intracranial Tumor."

Scholarships at Harvard Medical School.—With a view to lessening the burden of the worthy student, plans to establish additional scholarships at Harvard University Medical School are under consideration, according to the recent annual report of the dean, Dr. Charles Sidney Burwell. With a student enrolment of 526, the medical school at present gives about $12,000 a year in scholarships, averaging $250 each to about fifty students, student fellowships totaling $1,800 to about six students annually in return for investigative work, and loans of about $10,000 a year. Under the new prize scholarship plan, at least ten students in each of the four classes would receive the awards. The chief objective of the scholarship system is to relieve the brilliant student from the necessity of supporting himself by outside work, with the stipends adjusted to each person's need. Last year the school admitted a standard class of 125 students from 800 applicants.

MICHIGAN

Society News.—The annual banquet of the Phi Beta Pi Medical Fraternity will be held at the Fort Shelby Hotel, Detroit, April 24.——Dr. Russell D. Herrold, Chicago, read a paper before the Ingham County Medical Society, Lansing, March 16, on "The Criteria of Cure in Venereal Infection."

Hospital News.—A new $400,000 hospital was opened in Port Huron, February 25, following a dinner given by the St. Clair County Medical Society. The speakers included Drs. Angus McLean, James M. Robb, William J. Cassidy and Alpheus F. Jennings, all of Detroit; Dr. Thomas E. De Gurse, mayor of Marine City, and Dr. Theodore Heavenrich, Port Huron. Dr. Alexander J. MacKenzie, chief of staff of the hospital, was toastmaster. The hospital was financed in part by a PWA grant.

Conferences on Communicable Diseases.—The Wayne County Medical Society, the Detroit Tuberculosis Sanatorium Association and the Detroit Department of Health are sponsoring graduate conferences on tuberculosis and acute communicable diseases. They began March 31 and will continue Wednesday mornings to April 28, at the Herman Kiefer Hospital, Detroit. The speakers include:

Dr. Joseph S. Baird, Pittsburgh, Scarlet Fever.
Dr. Henry S. K. Willis, Northville, Tuberculin and Tuberculin Testing.
Dr. Russell L. Cecil, New York, Pneumonia.
Dr. Eugene L. Opie, New York, Tuberculosis and the Family.
Dr. Archibald L. Hoyne, Chicago, Meningitis.
Dr. Harold N. Cole, Cleveland, Syphilis.
Dr. Jacob J. Singer, St. Louis, Tuberculosis.

MINNESOTA

Industrial Medical Conference.—A Northwest Industrial Medical Conference will be a feature of the annual session of the Minnesota State Medical Association in St. Paul, May 2-5. The conference will open at the St. Paul Auditorium, Wednesday morning, May 5, with an address of welcome by Mr. F. T. Starkey, St. Paul, chairman, Minnesota Industrial Commission. Other speakers will include:

Dr. Maxwell J. Lick, Erie, Pa., president, Medical Society of the State of Pennsylvania, Differential Diagnosis in Acute Abdominal Tragedies.
Dr. Michael L. Mason, associate professor of surgery, Northwestern University Medical School, Chicago, Pitfalls in the Management of Hand Infections.
Dr. Wallace H. Cole, St. Paul, Hand and Wrist Injuries.
Dr. Joseph R. Kuth, Duluth, Back Injuries.
Dr. Winchell McK. Craig, Rochester, Adequate and Inadequate Treatment of Head Injuries.
Dr. Henry W. Meyerding, Rochester, Fracture Dislocation of the Shoulder.
Dr. Bertram S. Adams, Hibbing, Injuries to the Thigh.
Dr. Harry B. Macey, Rochester, New Automobiles and New Fractures.
Dr. Arthur A. Zierold, Minneapolis, Peripheral Nerve Injuries.
Dr. Robert F. McGandy, Minneapolis, Review of the Treatment of Burns.
Dr. Carl C. Chatterton, St. Paul, Certain Derangements of the Knee Joint.
Dr. Otto W. Yoerg, Minneapolis, Treatment of Os Calcis Fractures.
Dr. Frank H. Krusen, Rochester, Physical Therapy in Relation to Industrial Medicine.

Dr. Alfred W. Adson, Rochester, president of the state medical association, will act as chairman of a panel discussion concluding the session. Tuesday evening an "industrial dinner" will be held at the Hotel Lowry. The speakers will be Governor Elmer A. Benson, St. Paul; Dr. Adson, and Mr. Voyta Wrabetz, Madison, Wis., chairman of the Industrial Commission of Wisconsin, whose subject will be "Prompt Reporting and Cooperation with Commissions."

MISSOURI

Annual Campaign Against Diphtheria.—Members of the Jackson County Medical Society and the Kansas City department of health are cooperating in their annual campaign against diphtheria. Physicians during April are giving in their offices one injection of alum precipitated toxoid for immunization, charging a fee of $1 and using material supplied by the department of health. In 1936 there was not a single death attributed to diphtheria, the first time in the city's history.

Fifty Years in Practice.—Dr. Isadore J. Wolf, professor of medicine, University of Kansas School of Medicine, Lawrence-Kansas City, Kan., and president of the staff of Menorah Hospital, was guest of honor at a dinner, March 15, in celebration of his completion of fifty years in the practice of medicine. Dr. Fred Irwig presented Dr. Wolf with a gold watch on behalf of the hospital staff, and speakers included Rabbi Harry H. Mayer and Dr. Logan Clendening. Dr. Clinton K. Smith presided. Dr. Wolf is 73 years of age. He graduated from Ludwig-Maximilians University Faculty of Medicine, Munich, Germany, in 1887.

NEBRASKA

Society News.—A symposium on oxygen therapy was presented at the meeting of the Omaha-Douglas County Medical Society, March 9, by Dr. Fenimore E. Davis, Kansas City, Kan.; Dr. Ford K. Hick, Chicago, and Mr. J. I. Banash, consulting engineer, Chicago.——Dr. John C. Thompson, Lincoln, addressed the Platte-Loup Valley Medical Society in Columbus, recently, on etiology and treatment of cardiac diseases, and Dr. Joseph J. Hompes, Lincoln, showed eye clinics in India in motion pictures.

NEW HAMPSHIRE

Personal.—Dr. Chancey Adams, Concord, has been appointed physician of the state prison, succeeding the late Dr. Edward J. Delaney.

Lectures on Obstetrics. — The New Hampshire Medical Society and the state board of health are sponsoring a series of lectures on obstetrics as part of a statewide campaign to reduce infant and maternal mortality. The centers of instruction are Dover, Manchester, Hanover and Berlin. The lectures are given by Boston physicians.

NEW JERSEY

State Medical Meeting at Atlantic City.—The annual meeting of the Medical Society of New Jersey will be held in Haddon Hall, Atlantic City, April 27-29. General sessions will be held Tuesday afternoon and Thursday morning and sectional meetings Wednesday morning and Thursday afternoon. Speakers at the general sessions will be:

Dr. William P. Thompson, New York, Indications for Splenectomy.
Dr. Allen O. Whipple, New York, Results of Splenectomy in Some 100 Cases.
Dr. William Hall Lewis Jr., New York, Medical Aspects of Coma.
Dr. John Arthur MacLean Jr., New York, Surgical Management of Coma.
Dr. James Burns Amberson Jr., New York, Selection of Treatment for the Tuberculous Patient.
Dr. Adrian V. S. Lambert, New York, subject not announced.
Dr. Victor Carabba, New York, Electrosurgical Aseptic Intestinal Anastomosis.
Dr. Frederick C. Holden, New York, Again—Maternal Mortality Problems.
Drs. William Howard Barber and Anthony S. Bogatko, New York, Failures After Gastrojejunostomy.
Dr. Emery A. Rovenstine, New York, Oxygen Therapy by Oropharyngeal Insufflation.
Drs. Rita V. S. Finkler and Milton Friedman, Newark, Treatment of Pituitary and Ovarian Dysfunction.
Dr. Hugh H. Young, Baltimore, subject not announced.
Dr. Stanley R. Woodruff, Jersey City, Management of Ureteral Calculus.

There will be a general public health session Tuesday evening at which the speakers will be Drs. Charles Gordon Heyd, New York, President of the American Medical Association; Thomas Parran, surgeon general, U. S. Public Health Service, Washington, D. C., and Howard W. Haggard, New Haven, Conn.

NEW YORK

Dr. Munger Leaves Grasslands Hospital.—Dr. Claude W. Munger, director of Grasslands Hospital, Valhalla, for thirteen years, resigned March 18 to become director of St. Luke's Hospital, New York. Before going to Grasslands, Dr. Munger was director of Blodgett Memorial Hospital, Grand Rapids, Mich., and previous to that, superintendent of Columbia Hospital, Milwaukee. He is at present president of the American Hospital Association. He was graduated from Rush Medical College, Chicago, in 1916.

Society News.—Drs. Francis O. Harbach and I. Harris Levy addressed the Onondaga Medical Society, Syracuse, March 2, on "Carcinoma of the Male Urethra" and "Hypotension" and Dr. William A. Groat gave the first of a new series of reports on "What's New," discussing "What's New in Diabetes."—— Dr. John G. Fred Hiss, Syracuse, addressed the Oswego County Medical Society, Oswego, recently, on "Heart Problems in General Practice."—— Dr. Edward S. Godfrey Jr., Albany, state commissioner of health, addressed the Rochester Academy of Medicine, April 1, on "The Meaning of Public Health."——Dr. James G. Carr, Chicago, addressed the Niagara County Medical Society, Niagara Falls, recently, on diagnosis and treatment of coronary occlusion. ——Dr. Wildridge C. Thompson Jr., Albany, addressed the Ulster County Medical Society at its winter meeting in February on diagnosis and treatment of early syphilis.——Dr. John F. Erdmann, New York, addressed the Medical Society of the County of Westchester, White Plains, March 16, on "The Treatment of Cholecystitis, Choledochitis and Cholangeitis."

New York City

Long Island Alumni Day.—The annual Alumni Day of Long Island College of Medicine will be held April 24. Dr. Cassius H. Watson, medical director, American Telephone and Telegraph Company, will speak at a morning session and Dr. George H. Gehrmann, medical director of the E. I. Du Pont de Nemours Company, Wilmington, Del., at the afternoon meeting. The annual banquet will be at the Columbus Club, with Mr. Grover A. Whalen as the speaker.

Society News.—Drs. Tinsley R. Harrison, Nashville, Tenn., and Alfred E. Cohn addressed the New York Heart Association at a joint meeting with the section of medicine of the New York Academy of Medicine, March 16, on "Cardiac Dyspnea" and "Cardiac Diseases—Nosology and Public Health."

Changes in City Hospitals.—Dr. Edward M. Bernecker of the staff of Metropolitan Hospital on Welfare Island, who recently placed first in a civil service examination for the position of general medical superintendent in the New York City Department of Hospitals, took office March 15. Dr. Bernecker succeeds Dr. Adam Eberle, who has been made senior general medical superintendent. Dr. Emanuel Giddings, medical director of Morrisania Hospital, has been transferred to the same position at Kings County Hospital. Dr. Henry Greenberg, head of Fordham Hospital, succeeded Dr. Giddings at Morrisania and Dr. Stephen H. Ackerman has gone from Coney Island Hospital to Fordham. Dr. Charles G. McGaffin was placed in charge at Coney Island.

Personal. — Dr. Simon Flexner, director emeritus of the Rockefeller Institute for Medical Research, has been elected a trustee of Johns Hopkins University, Baltimore. Dr. Flexner has also been elected a foreign associate of the Academy of Sciences, Institute of France, to succeed the late Emanuele Paterno, Marquis di Sessa, Palermo, Sicily.——Dr. Wilbur A. Sawyer of the Rockefeller Foundation has been appointed a member of the National Advisory Health Council of the U. S. Public Health Service.——Dr. Aaron Arnold Karan, assistant director of the Jewish Hospital of Brooklyn, has resigned to become superintendent of the Workmen's Circle Sanatorium, Liberty, N. Y. Dr. Karan succeeds Dr. Bruno S. Harwood, who will enter private practice in New York.

Unlicensed Practitioners Convicted. — The New York State Board of Medical Examiners reports that Deidrich Meinking, Brooklyn, was convicted, February 27, of practicing medicine without a license and sentenced to three months in the workhouse. Martha Ferdinand at the same time was sentenced to serve three months in the workhouse, with the sentence suspended, and to pay a fine of $100, in default of the payment of which she was to serve twenty days in the workhouse. Richard Schlessinger was sentenced to three months in the workhouse, with the sentence suspended during good behavior. Benjamin Peltz was sentenced to three months in the workhouse, with sentence suspended during good behavior. Charles H. Worch, a Brooklyn chiropractor, was sentenced to thirty days in the workhouse or to pay a fine of $250. Raymond E. Hummel, Wantagh, L. I., associated with the "Eastern Chiropractic Institute Clinic," was recently sentenced to six months in the workhouse for practicing without a license. Anna Braeuer was sentenced to three months in the workhouse on a similar charge, with the sentence suspended.

NORTH CAROLINA

New Health Officers.—Dr. Walter Raleigh Parker, Woodland, has been appointed health officer of Northampton County to succeed Dr. Marion H. Seawell, Jackson, resigned. Dr. Wayland N. McKenzie, Albemarle, has been chosen to head a new health department in Stanly County to be opened in July. Dr. Harold C. Whims, Waxhaw, has succeeded Dr. Robert M. Bardin, Rutherfordton, as health officer of Rutherford County.

Two New Hospitals.—A new building for Rex Hospital, Raleigh, with a capacity of 200 beds, was opened for inspection by the public March 2. The necessary funds came from a bond issue of $287,000 and a PWA grant of $100,000. A campaign for public subscriptions raised $25,000 for equipment, but it is said that another $25,000 is needed.——The new Forsyth County Hospital for the Indigent near Winston-Salem has been completed and was open for public inspection March 1-2. There are seven units in the institution, the administration building, hospital ward, a ward for mental patients, dining halls, living quarters, laundry and garage. The hospital unit contains forty-two beds. The total cost of the group was $230,000, of which $102,024 was a PWA grant. A new sanatorium for tuberculous patients was recently completed on the county farm at a cost of $250,000. Dr. Joseph Lindsay Cook, county physician, is executive supervisor of the county hospital.

OHIO

Veteran Physicians Honored. — The staff of Polyclinic Hospital, Cleveland, gave a testimonial dinner March 6 in honor of Dr. Albert F. Spurney, one of the founders of the hospital, who has completed fifty years of medical practice. Dr. Spurney graduated from Western Reserve University School of Medicine in 1887 and was at one time instructor in therapeutics at the Physicians and Surgeons College. At various times he was on the staffs of the Cleveland General, Cleveland City and Saint Luke's hospitals.——Dr. James F. Leeper, McConnellsville, was the guest of honor at a meeting and banquet of the Morgan County Medical Society in January as the oldest practicing physician in the society. Dr. Lee Humphrey, Malta, was toastmaster. Dr. Leeper is 78 years old and graduated from the old Starling Medical College, Columbus, in 1878.

State Medical Meeting at Dayton April 28-29. — The ninety-first annual meeting of the Ohio State Medical Association will be held in Dayton, April 28-29, with headquarters at the Hotel Biltmore. Guest speakers who will address general sessions are:

Dr. Walter C. Alvarez, Rochester, Minn., Useful Hints in the Treatment of Gastro-Intestinal Disease.
Weston A. Price, D.D.S., Cleveland, New Light on Modern Physical Degeneration from Field Studies Among Primitive Races.
Dr. Frank E. Adair, New York, Preoperative Radiation in Operable Cancer of the Breast.
Dr. Fred W. Rankin, Lexington, Ky., The Hopeful Prognosis in Cancer of the Lower Gastro-Intestinal Tract.

Dr. Harry S. Gradle, Chicago, will address the section on eye, ear, nose and throat on "Diagnosis of Early Cases of Compensated Glaucoma." Among Ohio physicians who will appear on the program are:

Dr. Jesse Fremont Bateman, Columbus, The American Disease.
Dr. Samuel O. Freedlander, Cleveland, Total Pneumonectomy.
Drs. Charles A. Doan, Carl V. Moore and Thomas F. Ross, Columbus, Differential Diagnosis and Therapeutic Rationale of the Anemic States.
Dr. William B. Chamberlin, Cleveland, Conditions in Otolaryngology of Interest and Importance to the General Practitioner.
Dr. Clare R. Rittershofer, Cincinnati, Clinical Observations on Anemia in Children.
Dr. William H. Weir, Cleveland, Abdominal Panhysterectomy.

The annual banquet will be held Thursday evening, April 29, with Dr. Howard V. Dutrow, Dayton, as toastmaster. Lloyd C. Douglas, D.D., Los Angeles, author of "Magnificent Obsession" and "Green Light," will be the speaker.

OREGON

Personal.—Dr. Norman E. Irvine, Lebanon, has been elected president of the state board of health. Dr. Irvine was president also in 1933.——Dr. Elsworth L. Gardner, Portland, has been appointed health officer of Lane County, succeeding Dr. Alstrup N. Johnson, who resigned.——Dr. August E. Bostrom, DeSmet, S. D., has joined the staff of the state board of health in Portland.

PENNSYLVANIA

Annual Seminar in York. — The third annual graduate seminar course conducted by the medical societies of York and Adams counties was begun at York Hospital, March 18, and will continue on alternate Thursdays till May 27. The lecturers, all of Philadelphia, are:

Dr. Eldridge L. Eliason, Treatment of Fractures, March 18.
Dr. Edward A. Schumann, Obstetrics, April 1.
Dr. Vaughn C. Garner, Syphilis, April 15.
Dr. Richard A. Kern, Allergy, April 29.
Dr. George Harlan Wells, Pneumonia and Diabetes Mellitus, May 13.
Dr. William D. Stroud, Diseases of the Heart, May 27.

Philadelphia

School Health Director Honored.—Dr. Walter S. Cornell, director of the division of medical inspection in the Philadelphia public schools, was the guest of honor at a dinner February 9 celebrating his twenty-fifth anniversary in that position. Dr. Cornell is 60 years old and graduated from the University of Pennsylvania School of Medicine in 1901. He founded the system of medical inspection in the schools.

Society News. — Dr. Alexander Randall delivered the annual oration of the Philadelphia Academy of Surgery, March 1, on "Observations on the Origin and Growth of Renal Calculi."——William U. Gardner, Ph.D., New Haven, Conn., addressed the Pathological Society of Philadelphia, March 11, on "Influence of Estrogenic Hormones in the Stimulation of Abnormal Growths," and Dr. Helen Ingleby, "Etiology of Plasma Cell Mastitis."——A. Irving Hallowell, Ph.D., associate professor of anthropology, University of Pennsylvania, among others, addressed the Philadelphia Psychiatric Society, March 12, on "Normal and Abnormal Fears in a Native Indian Community."——A symposium on pernicious anemia was presented at a meeting of the Philadelphia County Medical Society March 24 by Drs. Max M. Strumia, Thomas Fitz-Hugh Jr., Michael A. Burns and William Egbert Robertson.

Pittsburgh

New Building for Mellon Institute.—A new home for the Mellon Institute for Industrial Research will be dedicated May 5-9, to replace the building on the campus of the University of Pittsburgh, where the institute has been for twenty-two years. The new building is nine stories high, though the four lower floors are below ground level. The style is Ionic, with columns around all four sides. It covers most of a city block. Mellon Institute was founded in 1913 by Andrew W. Mellon and Richard B. Mellon, an outgrowth of a trial of the fellowship system at the University of Pittsburgh. Since the beginning in 1911 there have been 1,150 industrial fellowships on 279 subjects of technology. Sixty-four fellowships are operating at present. It is expected that the new building will make possible expansion of present research and the development of new fields, especially in pure science. Edward R. Weidlein, Ph.D., is director of the institute.

RHODE ISLAND

Society News.—Drs. Cecil C. Dustin and Herman C. Pitts addressed the Providence Medical Association, April 5, on "Brucella Infections in Man" and "Sickness Insurance in Foreign Countries" respectively.——Dr. Mario A. Castallo, Philadelphia, addressed the Malpighi Medical Club, Providence, March 30, on "Management of Syphilis and Gonorrhea Complicating Pregnancy."

Building Program at State Mental Hospital.—Nineteen building projects are under way at the State Hospital for Mental Diseases, Howard, as a part of a $12,000,000 emergency public works program in state institutions. Among the new buildings is the psychiatric clinic to accommodate 120 patients, the medical and surgical building for 135 and a tuberculosis building for ninety. There will also be two new wards for patients with curable mental disorders, two for those with advanced mental disturbances, an administration building, dormitories for men and women employees, a staff house and several cottages for married physicians, and various service buildings. The women employees' dormitory was completed and dedicated in October 1936 and it is expected that other buildings will be finished at intervals during the coming year. Dr. Seth F. H. Howes is superintendent of the state mental hospital.

TENNESSEE

Society News.—Drs. Ola E. Ballou and James Sam Taylor presented papers at a meeting of the Anderson County Medical Society, Clinton, March 1, on diseases of the myocardium. ——Dr. Albert Weinstein, Nashville, addressed the Davidson County Medical Society, Nashville, April 6, on "Methyl Chloride (Refrigerator Gas) Poisoning."——Dr. Talbert C. Crowell, Chattanooga, discussed "Influences of Weather on Hay Fever and Asthma Patients" at a meeting of the Hamilton County Medical Society, Chattanooga, April 1.——Dr. Robert B. Wood, Knoxville, addressed the Knox County Medical Society, Knoxville, March 2, on "Nontuberculous Pulmonary Infections."——Dr. Launcelot Minor Blackford, Atlanta, addressed the Washington County Medical Society, April 2, on "Syphilis of the Aorta."

Professors Appointed.—Major George W. Reyer, Medical Corps, U. S. Army, has been appointed professor of military science and tactics with the reestablishment of the medical unit of the Reserve Officers Training Corps at Vanderbilt University School of Medicine, Nashville. Major Reyer was graduated from Vanderbilt in 1917 and has recently been at the Army and Navy General Hospital, Hot Springs National Park, Ark. Dr. Rudolph H. Kampmeier, recently clinical professor of medicine at the Louisiana State University School of Medicine, New Orleans, has been appointed assistant professor of medicine in the Vanderbilt medical faculty. Dr. Kampmeier was graduated from the State University of Iowa College of Medicine in 1923.

VIRGINIA

Society News.—Dr. Russell L. Cecil, New York, addressed the Richmond Academy of Medicine, March 23, on pneumonia. ——The Virginia Mental Hygiene Society was organized in February, with Dr. Beverley R. Tucker, Richmond, as president.——Dr. Robert Finley Gayle Jr., Richmond, was elected president of the Virginia Neuropsychiatric Society at a meeting in Richmond in January. Dr. Thomas N. Spessard, Roanoke, was made secretary.

Medical Progress in Richmond.—In connection with a celebration of the two hundredth anniversary of Richmond and the centennial of the Medical College of Virginia, an exhibit is being prepared to show to the public as well as to the medical profession the progress of medicine in Richmond during the city's history. Dr. Wyndham B. Blanton is in charge of the exhibit, which will be set up in the Richmond Academy of Medicine and in the library of the Medical College of Virginia. Individual exhibits will include old and modern sick rooms and operating rooms, photographs of Richmond physicians, old and modern instruments, medical books used in Virginia, medical photography and illustrations. Richmond hospitals and clinics will have booths to show their work and development, and the college itself will have several booths demonstrating its history and its work. The exhibits will open May 15 and continue through September.

GENERAL

Plans to Redraft Pharmacy Laws.—Plans for drafting a modern pharmacy law were announced after a meeting in Washington, January 17, of a committee appointed for the purpose at the annual meeting of the American Pharmaceutical Association in 1936. The draft of the new law will be presented at the next meeting of the association in New York in August. Officers of the state associations and state boards of pharmacy are being requested to give the committee the benefit of suggestions. The committee also announces that it will be pleased to confer with any state that is attempting to amend or rewrite its pharmacy law. The committee has the following members: R. L. Swain, Baltimore, chairman; H. C. Christensen, Chicago; R. C. Wilson, Athens, Ga.; Robert P. Fishelis, Trenton, N. J.; A. D. Baker, Denver, and H. V. DeHaven, West Chester, Pa.

American Pediatric Society.—The forty-ninth annual meeting of the American Pediatric Society will be held at The Homestead, Hot Springs, Va., April 29-May 1, under the presidency of Dr. Henry F. Helmholz, Rochester, Minn. The speakers will include:

Dr. Herman Yannet, New Haven, Conn., Effect of Hyperthermia on Distribution of Water and Electrolyte in Brain, Liver and Muscle.
Ann S. Minot, Ph.D., Nashville, Tenn., Factors Influencing the Disposition of Fluids Given Intravenously.
Drs. John A. Bigler, Highland Park, Ill., Laurie M. Hardy and Harry V. Scott, Chicago, Cryptorchism Treated with Gonadotropic Hormone, with Report of 100 Cases.
Drs. Albert Graeme Mitchell and Josef Warkany, Cincinnati, Ohio, Relation of Endocrine Disturbances to Certain Heredodegenerative Symptoms.
Dr. Randolph K. Byers, Boston, Tonic Neck Reflexes in Children, Considered from a Prognostic Standpoint.
Dr. Waldo E. Nelson, Cincinnati, Possibility of Sensitization to Tuberculin.
Drs. Mitchell I. Rubin and Milton Rapoport, Philadelphia, Cardiac Complications of Acute Hemorrhagic Nephritis.
Dr. Arthur F. Abt and Chester J. Farmer, M.A., Chicago, Cevitamic Acid Content of Blood Plasma.

Meetings on Industrial Medicine in Detroit.—The Midwest Conference on Occupational Diseases will be held in Detroit, May 3-5, and will be followed by the annual meeting of the American Association of Industrial Physicians and Surgeons, May 6-7. Both will meet at the Hotel Statler. Subjects of the sessions of the conference will be pulmonary diseases in industry, industrial hygiene engineering methods, industrial dermatoses, occupational diseases and the practitioner of medicine. Among the speakers at these sessions will be:

Dr. Emery R. Hayhurst, Columbus, Ohio, Industry as a Source of Disease.
Dr. Andrew R. Riddell, Toronto, Ont., Industrial Tuberculosis.
Dr. Marion B. Sulzberger, New York, Eczematous Dermatoses of Occupational Nature, with Special Reference to Proof of Occupational Origin.
Dr. Robert T. Legge, Berkeley, Calif., Occupational Diseases and the General Practice of Medicine.

At the meeting of the American Association of Industrial Physicians and Surgeons, of which Dr. Robert P. Knapp, South Manchester, Conn., is president, the speakers will include:

Dr. James A. Britton, Chicago, Compensation for Occupational Diseases.
Dr. John J. Moorhead, New York, Trends in Industrial Surgery.
Dr. Rosco G. Leland, director, Bureau of Medical Economics, Chicago, Economics and Ethics of Medicine.
Dr. Plinn F. Morse, Detroit, Medicolegal Aspects of Sudden Deaths in Industry.

There will be round table discussions on industrial hygiene, led by Dr. Royd R. Sayers of the U. S. Public Health Service, Washington, D. C., and on industrial medicine and surgery, led by Dr. Otto P. Geier, Cincinnati. The annual banquet will be held Thursday evening, May 6, with Dr. Loyal A. Shoudy, Bethlehem, Pa., as toastmaster.

Winners in National Safety Contest.—New York City won first prize in the fifth annual traffic safety contest conducted by the National Safety Council for the calendar year 1936. In the contest were 1,013 cities. New York was also first in the group of cities of populations larger than 500,000; Milwaukee was the winner in this group in 1935. First places in other population groups were as follows: Kansas City, Mo., cities from 250,000 to 500,000; Omaha, cities from 100,000 to 250,000; Jackson, Mich., cities from 50,000 to 100,000; West New York, N. J., cities from 25,000 to 50,000, and Wilmette, Ill., cities from 10,000 to 25,000. The judges named a special honor roll of 139 cities that had passed the year without a single traffic fatality. West New York was the largest of these. New York had 838 traffic accident deaths, 12.2 per cent lower than its 1935 total of 954 and 17 per cent lower than the average total for the three preceding years. Awards in this contest are made with consideration of various factors besides reduction of death rate, such as completeness in accident reporting, maintaining a permanent record of accidents, safe traffic planning and construction, effectiveness of traffic law enforcement, development of child safety and public safety education programs.

Federation of Societies for Experimental Biology.—The annual meeting of the Federation of American Societies for Experimental Biology will be held in Memphis, Tenn., April 21-24, under the auspices of the University of Tennessee School of Medicine and with headquarters at the Hotel Peabody. The federation is made up of four societies: the American Physiological Society, the American Society of Biological Chemists, the American Society for Pharmacology and Experimental Therapeutics and the American Society for Experimental Pathology. The first morning of the convention will be devoted to a joint meeting of all four groups with the following speakers:

Dr. Hallowell Davis, Boston, Electro-Encephalograms and Their Interpretation.
William C. Rose, Ph.D., Urbana, Ill., Further Experiments on the Nutritive Significance of the Amino Acids.
Dr. Velyien E. Henderson, Toronto, Ont., Humoral Transmission of Nerve Impulses.
Dr. Leo Loeb, St. Louis, The Biochemical Basis of Individuality.

The physiology program includes section meetings on endocrinology and metabolism, the central nervous system, carbohydrate metabolism, circulation and respiration, the kidney, nerve and general physiology, and a special symposium on coagulation of the blood. A few of the speakers are:

Dr. Louis N. Katz and S. Rodbard, Chicago, The Rôle of the Liver in Regulating the Distribution and Rate of the Blood Flow.
Dr. Charles H. Best, Arthur Charles, Ph.D., and Campbell Cowan, Toronto, Ont., The Administration of Heparin.
Dr. Herbert S. Gasser, New York, Responses of Nerve to Two Trains of Rhythmic Stimuli.
Dr. James B. Collip, Hans Selye and A. Neufeld, Montreal, Experimental Diabetes in the Monkey.

Among many speakers on the biochemistry program will be:

Leroy S. Palmer, Ph.D., Minneapolis, Biological Assay of Vitamin E; Application to Wheat Germ and Wheat Germ Oil.
Alfred Chanutin, Ph.D., and Stephan Ludewig, Ph.D., University, Va., Blood Plasma Proteins in Partially Nephrectomized Rats.
Dr. Frederic W. Schlutz and Minerva Morse, Ph.D., Chicago, Influence of Kidney Secretion upon the Concentration of Serum Chloride and Base of the Dog During Exercise.
Dr. Rudolf Schoenheimer, New York, Studies in the Intermediate Metabolism of the Fatty Acids with Deuterium as an Indicator.

Papers to be read at the meeting of pharmacologists will include:

Dr. Sanford M. Rosenthal and Hugo Bauer, U. S. Public Health Service, Chemotherapy of Bacterial Infections with Sulfonamide Compounds.
Dr. Carl A. Dragstedt and Franklin B. Mead, M.S., Chicago, Further Observations on Peptone Shock.
Dr. Nathan B. Eddy, Ann Arbor, Mich., Analgesic and Other Effects of Some Carbazoles.
Dr. Willis M. Fowler and Adelaide P. Barer, Ph.D., Iowa City, Retention and Utilization of Orally Administered Iron.

Addressing the society of pathologists will be the following, among others:

Drs. Charles A. Doan and Carl V. Moore, Columbus, Ohio, Correlation of Serum Iron, Bone Marrow and Blood Cell Changes Following Specific Therapy in the Macrocytic Anemias.
Dr. Jesse L. Bollman, Dr. Frank C. Mann and Eunice Flock, Rochester, Minn., Factors Influencing the Fatty Condition of the Liver Produced by Alcohol and a Diet Rich in Fat.
Forrest D. McCrea, Ph.D., and Harold M. Horack, Durham, N. C., The Effect of Artificial Fever on Experimental Rabies.

The afternoon of Friday, April 23, will be devoted to demonstrations at the university. The annual smoker will be held Thursday evening and the annual dinner Friday evening at the Peabody.

FOREIGN

Congress on Hematology.—An International Congress on Hematology will be held in Münster and Pyrmont, Germany, May 8-15, with Dr. Viktor Schilling, professor of internal medicine at the University of Münster, as chairman. Dr. Schilling has announced that interested hematologists from the United States will be welcomed at the congress.

Foreign Letters

LONDON

(From Our Regular Correspondent)

March 20, 1937.

Toxin Formation in Burns

Extensive burns produce systemic disturbances of which the causation is not well understood. W. C. Wilson, J. S. Jeffrey, A. N. Roxburgh and C. P. Stewart, of the department of surgery of the University of Edinburgh, have made an important investigation, which is reported in the *British Journal of Surgery*. They have clearly shown that toxin is generated in the burned tissues. The stage of acute toxemia begins between six and fifty hours after injury and not infrequently proves fatal about seventy hours after the burn. Clinical and pathologic studies strongly suggest the formation of toxin or toxins in the burned tissue and absorption into the circulation. There is also some evidence from experiments on animals. Recently, however, this view has been questioned.

As long ago as 1876, Avdakoff reported that the blood of a burned animal was toxic to healthy animals. In 1905 Pfeiffer published reports of experiments showing that the urine and blood serum of burned rabbits was toxic. But American experimenters—Underhill and Kapsinow—could discover no significant difference in action between extracts of burned skin and extracts of normal skin or between blood from burned animals and blood from normal animals. The Edinburgh investigators therefore decided that proof of the toxin theory was required. They made an incision in the middle line of the abdomen of rabbits under ether anesthesia, dissected up skin with subjacent platysma muscle as two lateral flaps, applied heat by diathermy to the deep surface of the flaps, and closed the incision. The animals subsequently showed no untoward symptoms. After varying intervals the edema fluid that accumulated was collected and injected into the ear vein of rabbits. Edema fluid removed four hours after the injury was always innocuous. Fluid removed at longer intervals was more and more toxic and at forty-eight hours highly toxic, killing forty of forty-four rabbits. Sometimes convulsions and death supervened within a few seconds of injecting from 3 to 5 cc. In other cases after several minutes muscular weakness, labored respiration, increased heart rate, pallor of the ears and hydriasis developed. The weakness increased, the temperature fell and death occurred after from one to five hours, sometimes preceded by muscular twitchings or general convulsions. Subcutaneous injections were also toxic but the lethal dose was larger. The fluid was found sterile; therefore bacteria played no part in the result. Autolysis of the injured tissue was evidently the mechanism of toxin production. In the fatal cases, fatty degeneration of the liver cells was found.

Precautions Against Air Raids

Precautions against air raids have now become such a topic that they are discussed almost daily in the press. Mr. Geoffrey Lloyd, undersecretary to the Home Office, stated in a reply to a question in the House of Commons that during an air raid the public should as far as possible remain indoors, in a part of their home or place of work that has been adapted as a refuge in accordance with instructions which will be issued. The question of provision of refuges for persons caught in the street when a raid is imminent is under consideration. It is considered that if ordinary safeguards are employed for these, the installation of a filtration plant will not be necessary. Arrangements will be made for detection of poison gas as part of the organization. Every effort will be made to warn the public of the presence of gas, which they may not be able to detect themselves.

A specimen gas-proof room has been fitted up in London by the special air raids precaution committee of the corporation of the city in conjunction with the St. John Ambulance Brigade. The room is open for public inspection daily and experts lecture at frequent intervals on precautions against poison gas. The committee has also issued a pamphlet on the preparation of a refuge room. In the list of material recommended for the furnishing is a wireless set for the information and entertainment of the occupants. The specimen room is hung with blankets tacked to the lintel with wooden strips, and the joints in the window are protected with strips of felt. It is shown how, by pasting three sheets of cellophane inside a window pane, the glass is not likely to splinter if exposed to the concussion of bombs in the street. Cracks in walls and floorboards, mouse holes and so on may be filled wth paper soaked in water and squeezed to pulp. A broken window may be made gas proof by nailing an old carpet across the frame. A more elaborate precaution exhibited is a wooden frame, the exact size of the window, covered with wire netting over which a blanket is stretched.

Similar precautions are being taken all over the country. At Eastbourne, a town on the east coast and therefore exposed to raids from the continent, a government expert lectured to a large audience presided over by the chairman of the Air Precautions Committee, who appealed for 650 volunteers to staff first aid posts. All the police have been trained and the second police reserve is now being trained. The town has been divided into nineteen sections, each controlled by a warden elected from among the volunteers. It is proposed to set up first aid posts, so that no one need walk more than a mile when contaminated with gas. All the civilian air raid training is entirely voluntary in England, whereas in Germany it is compulsory, as also is the provision of bomb-proof shelters. Mr. Wilmot, the government expert, said that nothing less than 15 or 20 feet of reinforced concrete would stop a direct hit by a high explosive, and the cost of shelters for the population was prohibitive. But every one could prepare splinter-proof rooms in his own home. In every home, shop and business place there should be gas-proof shelters. A corps of persons known as "gas detectors" is being organized throughout the country whose duty will be to detect gas and inform the authorities.

The government has decided that 300,000 volunteers are to be recruited as wardens, whose duty will be to advise residents on the officially recommended precautions against air raids, to assist in the distribution of civilian respirators, and to help the public both during and after an air raid. It is proposed that every district, singly or in cooperation with its neighbors and in consultation with the police, shall arrange for the organization and training of the air raid wardens. Wardens will operate from fixed posts, of which there will be one for every 500 inhabitants in residential districts and one to every quarter of a mile in industrial and business areas. The Air Raids Precautions Department has asked societies of experts in chemistry to help in the organization of a gas-detection service, which will be part of the local authorities' air raids precautions service. Their duties would be to proceed to an area where poison gas was reported, to decide whether gas was present, and, if so, which gas, and to advise on the extent of the danger.

A Forty-Eight Hour Week for Nurses

The nursing profession is the latest to be affected by the general tendency to reduce hours of work. Sir Kingsley Wood, minister of health, visited the Victoria Memorial Jewish Hospital, Manchester, to lay the foundation stone of a new nurses' home, which enables the present staff of fifty-one nurses to be increased by fifteen or twenty, and thus to be inaugurated, for the first time in Great Britain, a forty-eight hour week for nurses. The minister commended the hospital for the steps it had taken in the interest of nurses. Hours of work were a

difficult matter because the interests of the patient did not always permit of rigid adherence to a limit. On the other hand, exhausted nurses could not carry out their arduous duties. Exhausting hours were particularly deplorable for probationers, because they interfered with study and training. In hospitals which he had recently visited there was a decrease in the recruitment of nurses, and the conditions he had mentioned were calculated to have a deterrent effect. He therefore greatly valued the example set by the management of the Victoria Memorial Jewish Hospital in instituting a forty-eight hour week for nurses. He was glad to think that it had been largely inspired by a race whom Britons greatly valued in this country and whom we always desired to have with us. The hospital had never discriminated between suffering people on the basis of either creed or race.

PARIS

(From Our Regular Correspondent)

March 19, 1937.

Social Insurance and the Mortality Rate

In a recent letter (THE JOURNAL February 13, p. 568) an article by Dr. Phillip Dally on sickness insurance and mortality, which appeared in the Dec. 2, 1936, issue of the *Presse médicale*, was cited. The author stated that the mortality rate was lower in countries in which no social insurance laws were in effect. A criticism by Dr. Alexandre Roubakaine of this article and a reply by Dr. Dally appeared in the February 13 issue of the same journal. Dr. Roubakaine stated that sickness insurance applies only to treatment of those who are ill and that only minimal efforts had been made in any country in which such insurance exists, in the direction of prophylaxis; hence sickness insurance can have no influence on the mortality rate. The statistics quoted by Dr. Dally with regard to the mortality rate from diphtheria being less in non-socially insured countries had been correct but erroneously interpreted, because immunization against diphtheria had not been carried out in such countries; therefore one must bear this in mind when a failure to decrease the mortality in socially insured countries is quoted. For example, in non-socially insured countries, such as the United States and Canada, millions of children had been immunized since 1926. Roubakaine also disagrees with Dr. Dally on the statistics of mortality in general being lower in non-socially insured countries, citing first the latter group as follows: In the Union of South Africa and Canada the mortality has remained unchanged from 1921 to 1933. In Argentina there has been a drop of 21 per cent from 1921 to 1933. In the United States, Netherlands and New Zealand the drop in the mortality rate from 1905 to 1933 has been respectively 33, 30 and 22 per cent. In countries in which social insurance exists, in Germany the mortality between 1905 and 1933 has decreased 33 per cent, in England during the same interval 18 per cent, and in Chile 17 per cent. Thus one must conclude that the drop in mortality rate has taken place in the same rhythm or perhaps at a slightly accelerated rhythm in socially insured as compared to non-socially insured countries. Certain of the latter group (Canada, the United States, New Zealand) had a much lower mortality twenty-five years ago than England and Germany. Even the mortality rates from tuberculosis and children's diseases which were quoted by Dr. Dally as being lower in non-socially insured countries at the present time are wrong according to Roubakaine, because they were lower twenty-five years ago in these than in socially insured countries. On the contrary, the lowering of the mortality rate in Germany and England (where social insurance exists) has been more rapid than in non-socially insured countries such as the United States, Canada and Australia. In closing his criticism of Dr. Dally's statistics, Roubakaine again reminds one of his belief that social insurance bears no relation to the problem of mortality, because so little is being done by countries in which it exists, toward prophylaxis of disease. The object of social insurance, he again repeats, is to care for those already sick and not prevent those in good health from becoming ill.

Dr. Dally's reply was that Dr. Roubakaine maintains that social insurance is "equivalent to a system of treatment at reduced rates." Social insurance places salaried workers in the same category as indigents, for whom a system of relief aid when sick has existed for many years in all civilized countries. In France a third of the population is considered "feeble from an economic point of view," a milder form of expression for indigent. The medical profession does not balk at giving free service of the best kind to a small portion of the population when they are really indigent. But, in a system like that which the present social insurance law has brought about, which affects nearly the entire number of those who are ill, can one hope to give the same medical high grade care at cheap rates? If social insurance cannot modify the mortality rate as Dr. Roubakaine asserts, of what benefit to a country can it be? A better system than social insurance is to place every possible method of diagnosis, no matter how costly, at the disposition of the medical profession, the expenses being borne by the community. Medical men will then render the best services possible to the sick. For political reasons, another course has been taken here toward state medicine, thus depriving medicine of its therapeutic forces, which embrace the independence of the medical profession and a free choice of physician by the sick. "The statistics I have quoted prove that social insurance is a failure. I agree that prevention is the first duty of the state and if the social insurance organizations would do so, they would not exist in vain. A large sum of money, now sequestered, at least in France, ought to be devoted to prevention."

Definition of Proposed Public Health Centers

Since his appointment in June 1936 the present minister of public health, M. Henri Sellier, has proposed to establish "health centers" in every department of France. His object is a laudable one, to enable every citizen, even if unable to pay, to enjoy all the advantages of modern medicine. There has been much discussion as to what these health centers would do that is not being done by existing organizations. It will be recalled that reference has been made in recent letters to the offer of the Federation of Medical Syndicates, representing nearly every physician in France, to take complete charge of the medical aspects of such centers. In order to calm the rising storm of opposition to the establishment of health centers, which are regarded by many as an attempt to make every physician a state official, the assistant minister of public health, Dr. R. H. Hazemann, attempted to allay all fears by giving a definition of the health center at the recent meeting of the Congress on Hygiene held at Paris last October. He stated that there had never existed any plan by which state centers for treating patients would be established. The center was not a hospital in any sense of the word. There would be no wards, physicians or nurses. The department of public health only wishes to coordinate and centralize the present dispensaries and social service work. Although fundamentally a medical organization, the chief objective of the department is preventive and social medicine. There is much avoidable overlapping of the work of different public health agencies, which results in less efficient service than would be possible if better coordination existed. Wherever a given region does not possess dispensary service, one will be established. The functions of a health center will include surveillance of maternity cases and the new-born, school inspection, antituberculosis service, antisyphilitic service, detection of cancer and rheumatism cases and health examinations in addition to those at the school periods, to be made at the ages of 15 to 20 years (especially for early signs of tuberculosis) and between 45 and 50 years (for cardiorenal disease and cancer). The examinations are to be made by local practitioners, selected

by the departmental (medical) syndicate. The services are to be remunerated on the basis of a collective contract between the syndicate and the public health authorities. These preventive centers are to be aided by a well trained staff of visiting nurses. The health center, so far as its medical services are concerned, will be under the supervision of a full time physician. In each of the eighty-six departments a coordination committee is to be appointed, made up of delegates of existing public medical administrative organizations, delegates of existing endowed institutions and delegates from the medical syndicates, social insurance bureaus and labor unions.

Exteriorization of an Infected Uterus in Cesarean Section

At the January 20 meeting of the Académie de chirurgie, a paper was read by Louis Portes, associate professor of obstetrics at the Paris Faculté de médecine, on the end results of his method of exteriorization of the uterus in certain cases of cesarean section. He stated that the greatest obstacle encountered in obstetric surgery by the abdominal route was that associated with possible infection of the uterine cavity. When a cesarean section is deemed unavoidable at a late stage of labor, in the presence of an open amniotic sac and the likelihood that vaginal infection has extended to the uterine cavity, conservative cesarean operations, which have only a minimal mortality rate under normal conditions, become procedures accompanied by grave risks. Death of the mother can result from inoculation of the peritoneum with the septic intra-uterine contents, either immediately at the time of operation despite every possible precaution or after eight or ten days as the result of the breaking down of the infected wound in the uterine wall.

Portes has employed, since 1923, a technic (which is well illustrated in the Académie de chirurgie bulletin of January 20) in which the uterus, tubes and ovaries are well isolated by gauze packs from the other abdominal viscera. The uterus is then opened in the usual manner and, following delivery of its contents, the uterine incision is closed; but instead of the uterus, tubes and ovaries being replaced they are exteriorized by closure of the abdominal (parietal) incision tightly around the uterus at as low a level as possible. About three weeks later, the uterine incision can be made more resistant by secondary suture. The uterus, tubes and ovaries can then be replaced into the abdominal cavity about the thirty-fourth day.

Portes communicated the end result of the first case in which this technic was employed, in 1923. The patient, 21 years of age, had a normal delivery in 1922. Dr. Portes was called during the second pregnancy in 1923, when the bag of waters had been ruptured for 130 hours, the temperature being 100 F. and the pulse 160. The amniotic fluid had a fetid odor; hence the necessity of immediate evacuation of the uterus was indicated. Portes had at first contemplated performing a cesarean operation followed by hysterectomy, but he feared to replace the infected uterine stump in the abdominal cavity and decided to exteriorize following delivery of the fetus. His fear of a breaking down of the uterine scar was justified by the fact that this took place a few days after exteriorization of the uterus. The patient left the hospital fifty-one days after the operation.

Professor Portes was able to follow this first case during three subsequent pregnancies. In 1930 a second cesarean section was necessary on account of a contracted pelvis. Microscopic study of the scar of the first incision revealed that a normal reparative process had taken place. In 1934 a fourth pregnancy necessitated version and forceps delivery. In 1935 a fifth pregnancy ended in abortion.

Since this first exteriorization operation, Professor Portes has employed the same technic in a number of other cases with satisfactory results.

BERLIN

(From Our Regular Correspondent)

March 15, 1937.

New Aspects of Some Medical Questions and Nature Medicine

According to an announcement by the medical führer, Dr. Wagner, every new doctor is expected to engage in general practice for one year before entering a special field.

With the new year a "physicians' Sunday rest period" was inaugurated for the insurance physicians of Bavaria. It will apply to all Sundays and holidays. The rest period begins at 7 p. m. on the previous day and lasts till 7 a. m. on the next week day. In order to guarantee medical attention in emergencies a Sunday medical service has been set up based on mutual agreement among the insurance physicians as to which of them will serve on a given day.

The question of whether or not the sale of a medical practice in case of death, for example, or change of location, is compatible with professional ethics has been much controverted. It has been the general opinion of the more ethical members of the profession that a medical practice is far too personal and too much based on the confidence of the individual patient to be made the object of a commercial transaction. The highest Prussian tribunal, the Kammergericht of Berlin, has likewise recently gone on record against the sale of a medical practice. Conversely, the highest tribunal in Germany, the Reichsgericht, has decided that the compensated transfer of a practice from one physician to another in no way constitutes a breach of professional ethics. This is a juridical decision of the first importance and as such it is most worthy of note. Only under particular circumstances could such a transaction appear to be ethically reprehensible as, for example, if the buyer of the practice was compelled by the conditions of the contract to exploit his profession for pecuniary ends and thus disregard the supreme duty of every doctor; namely, service to the health of the individual patient and of the community.

The consultation of Jewish physicians, even those still permitted to practice medicine in Germany, by holders of public office, that is, officials, employees and others, has been made impossible by a decree of the present national minister of finance. Public servants can thus no longer receive monetary sick benefits and so-called emergency aids to cover indebtedness to any Jewish physician, dentist, pharmacist, lay practitioner, institution for the sick and convalescent, lying-in institution or undertaking establishment. Exception is made only in cases of a life and death emergency. Also in future the testimony of Jewish physicians with regard to the permanent or temporary disability of an insured person will no longer be considered competent. These provisions apply to all public servants and their dependents.

The National Organization for a New German Medicine, founded at Nuremberg in May 1935 (THE JOURNAL, April 11, 1936, p. 1327) has been dissolved. This national organization received a great deal of publicity at the time of its joint convention with the German Society of Internal Medicine (THE JOURNAL, Aug. 15, 1936, p. 514); elsewhere, however, it expended all its energies in the interests of Nature Medicine. The dissolution was made on the basis of the National Statute of Physicians at present in force, since according to this law all scientific organizations are under control of the National Health Bureau. The possibility for the national organization to remain in its old form therewith vanished. The functions and the aims remain, however, as the medical führer, Dr. Wagner, explained and he declares furthermore that already great sections of the German medical profession believe in the fundamentals of a new German medicine. The nature cure methods "so reprehensibly neglected in the past" have come to be included among the graduate studies of physicians. In future

the scientific building up of nature cure methods will be carried on under the president of the National Health Bureau. The ultimate educational objective, penetration of the entire medical profession by the new political ideology, will be carried forward by the National Socialist League of German Physicians under the leadership of Dr. Wagner himself.

As every one knows, persons without regular medical education are permitted to attend the sick in Germany. Such persons are known as heilpraktiker (lay practitioners). The Association of German Heilpraktiker has recently been recognized by the government and the Nazi party as the sole representative organization of the lay practitioners' group, and only members of this association are authorized to use the term "heilpraktiker." A person who does not belong to the association may perhaps call himself "heilkundiger" (healer) but never "heilpraktiker." A person who, being neither a licensed physician nor a heilpraktiker, attempts to treat disease is considered a quack.

In addition there is the National League of Chiropodists, with headquarters in Hamburg. These chiropodists have decided to establish a standard three year period of training. The chiropodists number among their activities the removal of corns and ingrowing toenails, and similar procedures, the manufacture of "foot appliances," the correction of plantar defects and the prescription of so-called hygienic footwear.

The question When should a healer refer his patient to a regular physician? is quite timely and important in view of the present state of toleration and recognition in Germany of uneducated healing practitioners, who in any other country would generally be regarded as charlatans. In this connection a recent opinion of the Supreme Court of Germany is significant. According to this opinion it is the duty of the untrained healer to refer the patient to a physician whenever the healer comes to realize after careful and conscientious attention and observation that more than his limited knowledge and skill is necessary for the treatment of the disease. The healer's responsibility is materially increased if the illness is serious and his own procedures have failed to produce a favorable response. If a healer has been asked by the patient or patient's relatives whether a physician should be called in to verify his capabilities and knowledge, the duty of referring the case to a physician becomes doubly incumbent on the healer.

In closing it might be mentioned that the Mazdaznan movement in all its ramifications has been dissolved and suppressed throughout Germany and its properties confiscated.

The Quality of the Mucosa

The investigations of the types of human physique carried on by the Tübingen school are a matter of common knowledge. A recent addition to these studies was a paper on the interrelation of physique and mucous membrane submitted by Dr. Schwarz in the Tübingen Medical Society.

In chronic catarrhal conditions of the nose, pharynx, larynx and middle ear, one finds during the interval between attacks that the mucosa is either thicker or thinner than the normal. Although paratypical influences are of course present, clinical observation has shown that individual variations in the quality of the mucous membrane existed prior to the onset of the disturbance. As the character of the mucosa is largely determined by that of the matrix (tunica propria) of the connective tissue, comparative examinations of the connective tissue of the embryonal mucosa of the middle ear were undertaken. It was observed that the cellular structure of the connective tissue possesses a developmental ability that differs with the individual person. It was further determined that the tendency to form fibrils within the connective tissue also presents individual variations. Since the matrix of the connective tissue is derived from the mesenchyma, that is, from the same germinal layer as the supporting and connective substances, an interrelation comes to exist between the mucous membrane and the bodily physique. It was possible to demonstrate that the mucosa of asthenic persons is delicate, thin and little perfused with blood, whereas that of sthenic persons is thick, juicy and well perfused with blood. It was further ascertained that among persons whose mucosa is manifestly hyperplastic, as among patients who suffer from nasal polyposis, the sthenic (that is, muscular, pyknic) type predominates. On the other hand, if manifest atrophy of the mucous membrane is present, as in ozena, a great majority of the patients are of asthenic physique. A connection between the physical type and the quality of the mucosa may be safely assumed on the basis of these observations. Till now, however, this interrelation had not been recognized.

No More Nobel Prizes for Germans

As recently told in the daily press, the German government on January 30 forbade on political grounds the future acceptance of a Nobel prize by a German. As an alternative there has been established a "German National Prize for Art and Science," which will consist of about 100,000 marks, to be distributed annually among three deserving Germans.

It is interesting to note in this connection how many Germans have been awarded the Nobel prize, which has been distributed almost uninterruptedly since 1901. The Nobel prize for medicine and physiology has been awarded to seven Germans: Emil Adolf von Behring, Robert Koch, Paul Ehrlich, Albrecht Kossel, Otto Meyerhof, Otto Warburg and latterly to the zoologist Hans Spemann in 1935. The chemistry prize was received by fifteen Germans, the physics prize by twelve, the prize for literature by five and the peace prize by three.

This proud roster of men whose contributions to knowledge have been deemed worthy of the highest honor has now been brought to an end.

BELGIUM

(From Our Regular Correspondent)

Feb. 28, 1937.

The Twenty-Eighth Congress of Professional Medicine

The twenty-eighth Congress of Professional Medicine brought a large number of physicians from all parts of Belgium to Liége. In the opening address Minister of Health Emile Vandervelde promised that prompt consideration would be given the much debated question of an "Ordre des médecins" (council to regulate professional ethics). He himself advocates legislation that would safeguard professional ethics and at the same time in no way impair professional freedom. He also evinced the keenest interest in the dissemination of carnets sanitaires (personal health records carried by citizens).

Dr. Férond's report on the more extensive use of the carnets sanitaires and the reports on the proposed medical professional legislation by Professors Brèyre and Coppez and Dr. Daubresse-Morelle all gave rise to lively discussions, which occupied the delegates throughout Saturday afternoon and Sunday morning. At the close of these deliberations the following resolutions were unanimously adopted:

1. Preventive medicine. From the standpoint of professional secrecy, the organization of preventive medicine as effected by the Fédération médicale belge excludes all possibility of indiscretion and abuse and assures efficient and permanent coordination among the various medical social services for the benefit of the person who holds a carnet sanitaire. Finally, it vouchsafes to every citizen a handy documentary record or balance sheet of his most precious possession, health. Any physician who wishes to see social medical service pledged to a cooperation with the rest of the medical profession, including the family practitioners, and who believes in the maintenance of an absolute professional secrecy, ought to participate in the campaign begun by the Fédération médicale belge within the domain of preventive medicine, on the basis of the program decided on by the Committee on Social Prophylaxis.

2. L'Ordre des médecins. The twenty-eighth Congress of Professional Medicine after having reconsidered and affirmed the urgent need for the creation in Belgium of a council to regulate exclusively the ethics of the medical profession, all financial and syndical considerations aside, demands the immediate creation and maintenance in activity by the executive council of the Fédération médicale belge of a permanent commission representative of the diverse opinions with regard to this question.

It will be the duty of this commission to attempt to formulate with the minimum of delay the first draft of a bill to regulate professional ethics, together with a summary of critical opinion. This bill in its final redaction will be introduced into parliament, and the commission will undertake in the course of the discussion incident to its eventual enactment to explain the objectives of the measure to both parliament and the general public. The commission will continue in existence until the legislation has been enacted.

THE CHEMOTHERAPY OF MALIGNANT TUMORS

Hans Auler of Berlin discussed the physicochemical bases of malignant tumors. After outlining various concepts that have enjoyed currency since the beginnings of the chemotherapeutic approach to cancer he discussed the fundamentals of this type of treatment and its prospects of development. The older concept is that therapeutic success depends not alone on the method of application but also on the affinity which a chemical substance may have for the cancerous cell, assuming that this substance is stored within the cancer cell and becomes active by accumulation. Direct action is, moreover, dependent on the vascularization of the tumor, a prime factor, since it is the circulatory system which must maintain the element hostile to the tumor within the diseased tissue. Auler makes macroscopic and microscopic demonstrations of the vascularization in malignant tumors and then studies the various ways in which substances employed in the chemotherapy of cancer may act. He described his personal experimentation with the effects of sodium desoxycholate and kindred substances derived from Buforana and Digitalis purpurea. He also discussed the interrelation of carbohydrate and cholesterol metabolism within the cancer patient.

Maisin and Pourbaix of Louvain discussed the organoprophylaxis of tar and benzopyrine cancers. They attempted chiefly an outline of the results of their own investigations carried on over the last three years. The principal fact elicited from these investigations was that the organs involved have at their disposal whole complexes of inhibitory and activitating substances, the equilibrium of which influences the karyokinetic processes within the organs with particular reference to the differentiation of the latter. The proportions of activating and inhibitory substances is not the same in all organs: certain organs in a fresh condition contain an excess of activating substances over inhibitory substances and vice versa. The liver, when fresh, is an example of an organ in which activating substances predominate, and the brain is an example of the opposite sort for, if in a fresh state, it presents a preponderance of inhibitory substances. Nevertheless, from both the liver and the brain effective substances having the recessive property may be obtained; thus, an organ containing principally activating substances contains at the same time quite effective inhibitory substances. Activating substances may be extracted into distilled neutral or alkaline water, but similar substances will still remain within the pulp of the organ in question. The inhibitory substances are much more difficult to extract and above all to preserve than the activating substances. The authors outlined two methods of extraction, with ether or with heated alcohol. Once extracted, the activating substances as well as the inhibitory substances resist boiling. Exceptions are the inhibitory substances from the stomach. After the extraction by ether of the inhibitory substances, the dry pulp of the organ is an activating mixture for tar cancer and benzopyrine cancer. Studies made of the desiccated stomach and of the same organ when boiled seem to indicate that the inhibitory substance can be a product of normal digestion. The authors asked whether the inhibitory substances are lysins or substances of differentiation. They believe that the production of activating substances and inhibitory substances forms part of a great process of oxidation-reduction which regulates fundamentally all tumoral metabolism and which lies at the base of antineoplastic immunity. It may be that the catalyzers of oxidation such as the peroxides play an important part in the production of these substances. The authors base this hypothesis on recent investigations of various syntheses of organic peroxides.

Care of the Maimed and Crippled

An interesting comparative study by Dr. Charles Dam, published in the July issue of the *Revue du travail,* concerns legislation aimed to protect the crippled. The following is a summary of Dr. Dam's conclusions:

1. Since the problem of aid for crippled persons is essentially the problem of aid for crippled children, it is necessary that the legal and administrative set up be such that: (*a*) the census and the follow up of crippled children will be assured; (*b*) these children will receive the most complete and skilful attention possible; (*c*) the organic laws of elementary education will permit all crippled children to receive proper instruction, it being understood that a child may continue his school work while he is undergoing medical treatment; (*d*) special classes may be organized in the public schools and indispensable special schools may be created by public authorities and private foundations; these schools will contain (1) complete clinical and consulting services, (2) kindergarten classes and classes in elementary instruction through all the grades and (3) vocational schools to which adults capable of receiving instruction will also be admitted.

2. It should be provided by law that a certain proportion of crippled persons be employed by various benevolent organizations at various mechanical tasks, as is customary in many other countries.

3. Workshops for the crippled should be established by means of special subsidies.

4. Local regulations should favor the more seriously afflicted cripples by reserving for them so far as it is practicable the care of newspaper stands and jobs in the minor trades.

5. There exists a most urgent need for social insurance legislation.

6. There should be more exact correlation of the various laws which regulate aid for the crippled, the blind, and the deaf-mutes. The problem of psychic abnormalities also requires more adequate legal regulation.

7. It would be desirable to enact special legislation for the deaf-mutes and the blind, since pedotechnical conditions among these groups will differ greatly from those of maimed and crippled persons.

It would be highly gratifying to see the Rotary Club's Association for the protection of crippled children expand its present activities (promotion of the education and treatment of crippled children) to include the sponsorship of trained crippled persons; that is, to continue to supervise and aid such persons in adulthood. By rendering this additional service the association would be performing one of the most necessary duties in the sphere of protection for the crippled. Nothing short of a comprehensive approach to the problem by a private agency will produce the optimal results.

Postvaccinal Encephalitis

Drs. Van den Branden and Nélis have published a study of postvaccinal encephalitis in the *Bruxelles médical.* They point out its rarity in Belgium as compared with other countries. The manifestations are apparently uninfluenced by the seasons.

The virus is unknown. The authors describe the lesions in the brain and spinal cord. The best prophylaxis is vaccination in early life. The treatment indicated is intravenous administration of serum either from persons who have recently undergone successful antivariolic vaccination or from an immunized horse.

Prize for Cancer Research Activities

The Belgian Mining Association of Upper Katanga (Belgian Kongo) has awarded a prize to Prof. E. L. Kennaway, one of its scientific staff, and to Prof. J. W. Cook of the Royal Cancer Hospital, London, for their work in cancer research.

The award was made at the second Cancer Congress, held at Brussels late in September. The prize consisted of 50,000 Belgian francs and 50 mg. of radium.

AUSTRALIA

(From Our Regular Correspondent)

Feb. 24, 1937.

Chronic Nephritis and Lead Poisoning in Queensland

A study of mortality causes in Queensland shows that a large number of people die at an early age from kidney disease. Sometimes several members of one family are affected. The incidence of lead poisoning among children in Queensland is high. It must be understood that in Queensland, owing to the tropical sun, the paint on exposed surfaces powders readily, so that there is an abundance of lead carbonate available to be picked up by youthful fingers.

Medical practitioners in Brisbane and other parts of Queensland have long held that chronic nephritis, terminating fatally in uremia, is more prevalent in that part of Australia than it is in other parts of the world. In 1929 D. G. Croll put this impression on a sound statistical basis by showing from the death returns of the ten year period 1917-1926 that 1,309 persons in 800,000 of the population died of chronic nephritis in Queensland before the age of 40, whereas in the other three states of the commonwealth the number was 436, 421 and 418. A graph of the deaths in the various age groups indicates clearly that a cause nonexistent or nonoperative in the other states was responsible for this strangely high mortality in Queensland, with its peak in the 20 to 29 age group. It fell to L. J. J. Nye of Brisbane to relate this mortality to chronic plumbism in "Chronic Nephritis and Lead Poisoning," a work that may be regarded as the most important contribution of Queensland to medical knowledge since T. L. Bancroft discovered the adult filarial worm there fifty-eight years ago.

Cases of wrist-drop and foot-drop were first described in Queensland children in 1892. In 1897 J. L. Gibson began to encounter weakness of the external recti combined with papill-edema, which he regarded as an early and therefore important sign of lead poisoning; in fifteen years he saw fifty-four cases. In seeking a cause for the plumbism, Nye was led to examine closely the habits of children. In Queensland the verandas of houses are commonly built with railings of wood, which, especially in the neighborhood of towns, are usually painted with white lead paint. In that semitropical climate the sun soon converts this paint into a powdery substance which rubs off easily on the hands, and this has been found to be a soluble carbonate of lead. In the summer young children spend a large part of their time on the verandas, and the younger members of the families affected are generally in the habit of biting their nails or sucking their fingers. Among children a local pastime was discovered which consisted in licking the rain drops from the veranda railings. More recently S. F. McDonald, going over the same ground, accepted the "paint-fingers-mouth" theory of causation as the best working hypothesis. As a rule the patient first comes under medical observation early in adolescence, the history being that for years the child has not been as well as other children. In later stages this lassitude increases, and anemia, vomiting, failing vision and often epistaxis occur. Elevation of blood pressure is invariably present and is accompanied by hypertrophy of the heart. Occasionally cerebral hemorrhage resulting in hemiplegia has been observed. Retinal vascular changes, with engorgement of veins, hemorrhages, exudate and choked disks, are commonly seen. Edema is inconspicuous, and renal failure ending in uremia is the usual conclusion.

A federal investigation published in 1932 upheld the contention that kidney disease in young persons in Queensland is extraordinarily prevalent. It reached the tentative conclusion that the chronic nephritis common in Queensland arises, as elsewhere, as a result of many factors productive of kidney damage, including principally familial weakness of the kidney fabric, damage produced by congenital syphilis, and conditions set up as the result of the acute or prolonged action of toxins derived from pathogenic organisms. In Brisbane, in cases in which such predispositions exist, the concurrent ingestion of infinitesimal doses of lead from an undetermined source appears in a proportion of cases to precipitate a fatal issue many years earlier than would otherwise be the case, weeding out the great mass of patients with chronic nephritis before they attain the age of 40. Since whatever factor is operating in Brisbane appears to be operative also in several other cities of the Brisbane type, the possibility of lead poisoning being a factor in these areas, though it does not figure in hospital records, cannot be entirely discounted but must be investigated before conclusions can be accepted as final. The work on which these tentative conclusions are based is included in the full report submitted to the director general of health in Canberra. Nye replied to the conclusions of the official inquiry by showing that after a careful review of the statistical, clinical, environmental and experimental evidence that has been collected in the federal report and in his work it must be admitted that lead poisoning in childhood is at least one factor which is responsible for the high rate of mortality from chronic nephritis in Queensland—a rate, however, which happily now shows some signs of abating. The amount of positive evidence incriminating lead paint is indeed so overwhelming that it seems almost perverse to insist on a further search for other causes before taking preventive measures against poisoning. Nye's work emphatically teaches the lesson of the damaging effects of lead on young tissue and strengthens the demand that lead should be forbidden in paint, especially on surfaces such as veranda railings and gates to which children have ready access.

Marriages

JEROME ENGEL, Ravena, N. Y., to Miss Pauline Barthman Feder of East Orange, N. J., in Albany, N. Y., March 17.

NEWSOM P. BATTLE to DR. MARGARET ELIZABETH WHITE, both of Rocky Mount, N. C., in Detroit, January 2.

IRWIN W. BARRETT, Clarksdale, Miss., to DR. ALLIE M. ARRINGTON of Richton, February 28.

MAXCY WILBUR HOOK to Miss Mary Wilson Meiklejohn, both of Cheraw, S. C., March 18.

JOSEPH G. GUSTAFSON, Moline, Ill., to Miss Hilda Koosman of Wausau, Wis., Sept. 21, 1936.

FRANCIS RAMON BURKE to Miss Mary Stuart Merritt, both of Quincy, Mass., January 23.

FREDERIC L. BAER to Miss Jeanne Lois Traugott, both of Indianapolis, Dec. 24, 1936.

CLARENCE S. COSTIGAN, Moline, Ill., to Miss Frances Ostewig of Chicago, Nov. 26, 1936.

JUDD R. BREAKSTONE to Miss Gertrude Stern, both of Chicago, January 29.

GUY E. DORE to Miss Doris Elizabeth Ladd, both of Guilford, Maine, April 3.

Deaths

Theobald Mathew Marie Flynn, Erie, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1911; member of the Medical Society of the State of Pennsylvania; fellow of the American College of Surgeons; consulting obstetrician, gynecologist and staff surgeon to St. Vincent's Hospital; member, associate staff, Hamot Hospital; consulting gynecologist to St. Joseph's Orphan Asylum; assistant surgeon, Pennsylvania Railroad; aged 61; died, February 6, of carcinoma of the prostate.

Forrest Kendall Anderson, Sonyea, N. Y.; Baylor University College of Medicine, Dallas, Texas, 1929; member of the Medical Society of the State of New York; member of the consulting staff, Craig Colony, Sonyea, and member of the junior dermatologic staff of the Rochester General Hospital, outpatient department; formerly member of the staff of the state department of health; aged 31; died, February 13, of teratoma with pulmonary metastases.

Cornelius Doremus Van Wagenen ✠ New York; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1893; member of the city health department in 1897; assistant otologic surgeon to the Manhattan Eye, Ear and Throat Hospital; attending otolaryngologist to the Seton Hospital, 1904-1914; aged 71, died, March 5, in the Harbor Hospital, of arteriosclerosis and hypertension.

George Mossman, Gardner, Mass.; University of Vermont College of Medicine, Burlington, 1914; member of the Massachusetts Medical Society; fellow of the American College of Surgeons; served during the World War; on the staffs of the Henry Heywood Memorial Hospital and the Gardner State Hospital; school physician of Westminster; aged 47; died, February 7, of influenza.

Simon Tannenbaum ✠ New York; Bellevue Hospital Medical College, New York, 1896; medical director of the Sydenham Hospital; formerly superintendent of the Beth David Hospital; at one time served as the director of the medical activities in Palestine of Hadassah, and was director of the Hadassah Hospital; aged 64; died, March 1, of arteriosclerosis.

Charles Beaver Mack, Boston; Jefferson Medical College of Philadelphia, 1910; district health officer in the Boston metropolitan area; medical director of the Episcopal Eye, Ear and Throat Hospital, Washington, D. C., 1922-1927; served during the World War; aged 50; died suddenly, January 23, of coronary thrombosis and hypertension.

Harris Fenton Brownlee, Danbury, Conn.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1888; member of the Connecticut State Medical Society; fellow of the American College of Surgeons; on the staff of the Danbury Hospital; aged 70; died, February 24, of cerebral arteriosclerosis.

William C. Dixon, Greenville, Ill.; Beaumont Hospital Medical College, St. Louis, 1895; member of the Illinois State Medical Society; president of the Bond County Medical Society and past president of the Vermilion County Medical Society; formerly health officer of Danville; aged 67; died, February 12, in the Barnes Hospital, St. Louis.

Thomas J. McArthur, Cordele, Ga.; Southern Medical College, Atlanta, 1894; member of the Medical Association of Georgia; past president of the state board of medical examiners and member of the state board of health; on the staff of the Cordele Sanatorium; aged 68; died suddenly, February 15, of heart disease.

Thomas Owen Maxwell, Austin, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1878; member of the State Medical Association of Texas; formerly superintendent of the Texas Training School for Defectives and Sanitarium for Mental and Nervous Diseases; aged 83; died, February 18.

Joel Isham Denman, Kansas City, Mo.; Beaumont Hospital Medical College, St. Louis, 1900; member of the Missouri State Medical Association; served during the World War; aged 59; on the staffs of the Providence Hospital and St. Mary's Hospital, where he died, February 2, of a skull fracture received in a fall.

James David Lowry, Fort Dodge, Iowa; State University of Iowa College of Medicine, Iowa City, 1901; member of the Iowa State Medical Society; past president of the state board of health; formerly county coroner and city health officer; aged 60; died, February 10, in the Mercy Hospital.

David Garrison Ghrist ✠ Los Angeles; Harvard University Medical School, Boston, 1925; fellow of the American College of Physicians; on the staffs of the Los Angeles County Hospital, Hospital of the Good Samaritan and St. Vincent's Hospital; aged 38; died, February 3, of pneumonia.

Delmar Ivan Martin, Springfield, Ill.; Northwestern University Medical School, Chicago, 1929; member of the Illinois State Medical Society; president of the county tuberculosis board; served during the World War; aged 35; died, February 21, in St. John's Hospital, of pneumonia.

Carl Alfred Feige ✠ Canova, S. D.; Hahnemann Medical College and Hospital, Chicago, 1906; member and past president of the state board of health; served during the World War; on the staff of the Canova Hospital; aged 58; died, January 26, of carcinoma of the intestine.

Samuel Beaver Geise ✠ Sunbury, Pa.; Medico-Chirurgical College of Philadelphia, 1903; served during the World War; on the staffs of the Evangelical Hospital, Lewisburg, and the Mary M. Packer Hospital; aged 59; died, February 2, in Alcolu, S. C., of coronary occlusion.

Cecil Corwin Johnson ✠ Le Claire, Iowa; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1901; formerly member of the city council of Le Claire; aged 59; died, February 18, in St. Luke's Hospital, Davenport.

Elbert Horton Downs, Montgomery, Ala.; Chattanooga (Tenn.) Medical College, 1900; member of the Medical Association of the State of Alabama; aged 66; died, February 13, in a local infirmary, of nephritis, cerebral hemorrhage and hypertension.

Fredrick R. Bueche ✠ Steubenville, Ohio; Georgetown University School of Medicine, Washington, D. C., 1920; aged 41; on the staff of the Ohio Valley Hospital, where he died, February 6, of a skull fracture received in an automobile accident.

Henry M. Boies, Albany, Ill.; Jenner Medical College, Chicago, 1910; member of the Illinois State Medical Society; served during the World War; aged 57; died, February 24, in the Veterans Administration Facility, Hines, of pneumonia.

Joseph Cohen ✠ Berwick, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1906; past president of the Columbia County Medical Society; on the staff of the Berwick Hospital; aged 54; died, February 10, of pneumonia.

Fred Louis Holcomb ✠ Coldwater, Kan.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1901; president of the Comanche County Medical Society; aged 59; died, January 31, following an automobile accident.

Luther Marshall Jayne ✠ Niagara Falls, N. Y.; University of Buffalo School of Medicine, 1906; on the staffs of Mount St. Mary's Hospital and the Niagara Falls Memorial Hospital; aged 54; died, February 3, of coronary thrombosis.

Mary Agnes Laughlin, Hagerstown, Md.; Woman's Medical College of Pennsylvania, Philadelphia, 1898; member of the Medical and Chirurgical Faculty of Maryland; aged 68; died, February 2, of carcinoma of the breast.

Carl Henry Cunningham, Indianapolis; Indiana University School of Medicine, Indianapolis, 1928; member of the Indiana State Medical Association; aged 41; died, February 10, in St. Vincent's Hospital, of ulcerative colitis.

Ernest Watson Kelsey, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1894; member of the Medical Society of the State of Pennsylvania; aged 65; died, February 8, of cirrhosis of the liver.

Sarah Marcy Crawford, Newton, Mass.; Woman's Medical College of the New York Infirmary for Women and Children, 1877; member of the Massachusetts Medical Society; aged 92; died, February 15, of bronchopneumonia.

Benjamin Geret Gossow, St. Charles, Mo.; St. Louis University School of Medicine, 1922; member of the Missouri State Medical Association; on the staff of St. Joseph's Hospital; aged 40; died, February 8, of pneumonia.

Nathaniel Niles Morse, Goffstown, N. H.; Harvard University Medical School, Boston, 1904; member of the Associated Anesthetists of the United States and Canada; aged 60; died, February 24, of emphysema.

Leslie Frank Mulford, Philadelphia; Jefferson Medical College of Philadelphia, 1911; instructor in surgery at his alma mater; served during the World War; aged 53; died, March 6, in Miami, Fla., of heart disease.

Joseph Cooperstein, Flint, Mich.; College of Physicians and Surgeons of Chicago, School of Medicine of the University

of Illinois, 1909; aged 54; died, February 14, in the Hurley Hospital, of coronary thrombosis.

Charles J. Mooney, Washington, D. C.; College of Physicians and Surgeons, Baltimore, 1904; aged 62; died, February 3, in the Gallinger Municipal Hospital, of hypertensive heart disease and cirrhosis of the liver.

Joseph Franklin Moell, Lincoln, Neb.; Northwestern University Medical School, Chicago, 1907; member of the Nebraska State Medical Association; aged 58; died, January 21, of pneumonia complicated by meningitis.

Clarence Leslie Stammers, Los Angeles; California Eclectic Medical College, Los Angeles, 1914; aged 49; died, January 21, in the National Military Home, of bronchopneumonia and coronary thrombosis.

Willis Edwards Lowry Jr. ✠ Laredo, Texas; University of Texas School of Medicine, Galveston, 1924; served during the World War; on the staff of the Mercy Hospital; aged 40; died, February 6, of influenza.

John Ignatius McGuigan, Philadelphia; Jefferson Medical College of Philadelphia, 1887; on the staff of the Chestnut Hill Hospital; aged 70; died, February 19, in Bangor, Maine, of arteriosclerosis.

Harrell Myers Graham, Scranton, S. C.; Medical College of the State of South Carolina, Charleston, 1909; member of the South Carolina Medical Association; aged 51; was found dead, February 1.

William Margulies ✠ Brooklyn; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1890; on the staff of the Beth Moses Hospital; aged 68; died, February 8.

Arthur Edgar Kennedy, Washington, D. C.; University of West Tennessee College of Medicine and Surgery, Memphis, 1917; aged 42; died, February 6, in Lorton, Va., of influenza and pneumonia.

John William Boyd, Sarcoxie, Mo.; Barnes Medical College, St. Louis, 1896; served during the World War; aged 65; died, February 3, in St. John's Hospital, Joplin, of septicemia and pneumonia.

Arthur T. Gregory, Mauston, Wis.; College of Physicians and Surgeons of Chicago, 1894; formerly secretary of the Juneau County Medical Society; aged 81; died, February 6, of pneumonia.

James David Howard ✠ Mount Lebanon, Pa.; Jefferson Medical College of Philadelphia, 1920; on the staff of St. Joseph's Hospital and Dispensary, Pittsburgh; aged 41; died, February 2.

Albert Columbus Lofton, Lucien, Miss.; Memphis (Tenn.) Hospital Medical College, 1906; served during the World War; aged 61; died, February 22, in a hospital at Brookhaven, of pneumonia.

Charles Franklin Doran ✠ Phoenixville, Pa.; Jefferson Medical College of Philadelphia, 1896; aged 67; on the staff of the Phoenixville Hospital, where he died, February 24, of pneumonia.

Willion Huey McCombs ✠ Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1895; on the staff of the South Side Hospital; aged 69; died, February 22, of coronary occlusion.

William Edward Gholson, La Center, Ky.; University of Louisville Medical Department, 1894; member of the Kentucky State Medical Association; aged 65; died, February 4, of pneumonia.

Thomas Linville ✠ Washington, D. C.; George Washington University School of Medicine, Washington, 1904; aged 62; died, February 1, of coronary occlusion and hypertension.

Edward Webster Bookhart, Wall Lake, Iowa; Lincoln (Neb.) Medical College of Cotner University, 1906; served during the World War; aged 56; died, February 9, of pyelitis.

Walter Asbury Newman, Manassas, Va.; Medical College of Virginia, Richmond, 1876; University of the City of New York Medical Department, 1878; aged 83; died, January 26.

Arthur Gilbert Bentley, Tipton, Tenn.; Memphis Hospital Medical College, 1910; aged 51; died, February 19, in the Baptist Memorial Hospital, Memphis, of pneumonia.

George Austin Carter, Hardwick, Vt.; Dartmouth Medical School, Hanover, N. H., 1890; on the staff of the Hardwick Hospital; aged 72; died, February 5, of influenza.

Wilhelmus Bogart Robinson, Ionia Island, N. Y.; New York Homeopathic Medical College and Hospital, 1888; aged 77; died, January 31, of carcinoma of the prostate.

Claiborne W. Evans, Modesto, Calif.; University of California Medical Department, San Francisco, 1881; aged 77; died, February 7, in San Francisco, of pneumonia.

Frank Borland Dake, State Sanatorium, Ark.; University of Tennessee Medical Department, Nashville, 1887; aged 72; died, February 15, of pulmonary tuberculosis.

Helen Robertson Howe-Gage, Suffield, Conn.; Woman's Medical College of Pennsylvania, Philadelphia, 1901; aged 60; died, January 6, of carcinoma of the sigmoid.

James Ambrose Malone ✠ Athens, Ohio; University of Cincinnati College of Medicine, 1924; aged 49; died, February 6, in the Mount Carmel Hospital, Columbus.

Elmer Ellsworth Cary, Ithaca, N. Y.; Bellevue Hospital Medical College, New York, 1887; aged 75; died, February 11, of chronic myocarditis and left hemiplegia.

William Carlile Caldwell, Wentzville, Mo. (licensed in Missouri in 1901); member of the Missouri State Medical Association; aged 65; died, February 15.

Charles William O'Donnell, Andover, N. Y.; University of the City of New York Medical Department, 1884; aged 76; died, January 28, of arteriosclerosis.

Charles B. Mulvey, Montpelier, Ind.; Medical College of Indiana, Indianapolis, 1894; formerly county health officer; aged 68; died, February 24, of influenza.

Patrick Henry Glancy, Parkersburg, W. Va.; Hospital College of Medicine, Louisville, Ky., 1892; aged 70; died, February 15, of cerebral hemorrhage.

Lazarus Sylvester Sobel, New York; University of Vermont College of Medicine, Burlington, 1894; aged 67; died, January 29, of coronary sclerosis.

Daniel Morris Harvey, Oakland, Calif.; Cooper Medical College, San Francisco, 1889; aged 81; died, January 31, of acute dilatation of the heart.

Edward S. Coats, Plains, Mont.; Kansas City (Mo.) Hahnemann Medical College, 1909; aged 66; died, January 15, of carcinoma of the bladder.

Arthur Eisbein, Buffalo; University of Buffalo School of Medicine, 1901; aged 62; died, February 13, of coronary occlusion and arteriosclerosis.

Mary Electa Clark, Chatham, N. Y.; New York Medical College and Hospital for Women, 1897; aged 91; died, January 8, of chronic nephritis.

George Wesley Beatty, Brooklyn; Long Island College Hospital, Brooklyn, 1898; served during the World War; aged 65; died, February 8.

Norman Buell Marshall, Chicago; Jefferson Medical College of Philadelphia, 1883; aged 76; died, February 26, of carcinoma of the ear.

Wadie Fadoul Courie, Detroit; Medical College of Virginia, Richmond, 1912; aged 51; died, February 14, in Kinston, N. C., of carcinoma.

Andrew Grassau, Caledonia, Ill.; Rush Medical College, Chicago, 1896; aged 68; died, February 10, in a hospital at Fort Myers, Fla.

De Witte Stone, Sayre, Okla.; Tulane University of Louisiana Medical Department, New Orleans, 1897; aged 63; died in January.

Monta B. Carr, Tazewell, Tenn.; Tennessee Medical College, Knoxville, 1902; county health officer; aged 66; died, February 10.

James T. Dicks, Nashville, Tenn.; Chicago Homeopathic Medical College, 1880; aged 84; died, February 8, of cerebral hemorrhage.

Hiram Davis Loflin, Henderson, Ala.; Medical College of Alabama, Mobile, 1904; aged 55; died, February 14, of coronary thrombosis.

William Fountain, New York; University College of Medicine, Richmond, 1898; aged 66; died, February 22, of coronary sclerosis.

Joseph Lynn Carnahan, Kansas City, Mo.; Kansas City Medical College, 1892; Civil War veteran; aged 92; died, February 6.

William Henry Woods, Mount Brydges, Ont., Canada; Trinity Medical College, Toronto, 1898; aged 65; died, January 27.

Merida F. Brown, West Hamlin, W. Va.; Kentucky School of Medicine, Louisville, 1905; aged 59; died in February.

James Lewis Pennington, Thedford, Neb.; Barnes Medical College, St. Louis, 1893; aged 68; died, January 27.

Bureau of Investigation

BENGAMIN GAYELORD HAUSER

Fruits, Vegetables—and Nuts

"Dr." Bengamin Gayelord Hauser, widely promoted for a while in various newspapers, is now billed in commercial food pamphlets of the Modern Health Products, Inc., of Milwaukee as a "World Famous Authority on Dietetics . . ." and "the famous Viennese scientist." He is not a doctor of medicine, not a Viennese and certainly not a scientist. Hauser endorses the concoctions of the Modern Health Products, and the Modern Health Products, of which Carl S. Hauser is vice president and treasurer, endorses Bengamin Gayelord Hauser.

In common with others of the mysterious men and women who appear out of the nowhere as "international scientists," "leading authorities on diet" and "world-famous lecturers on health," Hauser offers a series of free lectures on diet and health as a "come-on" for a special lecture course to be given at the conclusion of the free lectures. In addition, books, pamphlets and preparations of Modern Health Products, Inc., are recommended.

Unfortunately, the whys and wherefores of physiology, chemistry, anatomy and hygiene do not descend upon one as did the revelations of the prophets. Yet in some such supernatural manner must the "advertising scientists" have received their academic knowledge. For if these gentlemen and ladies of the lecture platform have left any record of their undergraduate training in accredited universities or colleges, it must have been as delicate as gossamer, and as intangible.

Hauser first came to the attention of the Bureau of Investigation in 1926, when a St. Louis newspaper announced that "Dr." B. Gayelord Hauser, "head of a New School of Health in Chicago," would give a series of free lectures in St. Louis. A Hauser class announcement of about the same period carried a quotation from George Starr White, M.D. "George Starr White—Quack" was the title of an article in THE JOURNAL for April 13, 1929, page 1292. In summary, the article stated: ". . . George Starr White is a quack who has commercialized the practice of medicine, who has no scientific standing, and whose opinions on matters dealing with modern medicine are wholly without value."

In 1926 the stationery used by a Helen Linch in writing for "Dr." Hauser to a Grand Rapids, Mich., inquirer, carried the heading "Bengaman Gaylord Hauser, M.D." A thorough search of the biographic files of the American Medical Association failed to reveal any one by the name of Bengaman Gayelord Hauser as a graduate of any medical college or licensed to practice medicine in any state in the Union. If Hauser was not trying to pass himself off as a Doctor of Medicine, the stationery used for him certainly left no doubt that Hauser was an M.D. It seems incredible that Hauser could have been represented as an M.D. without his knowledge, as Helen Linch was supplying "Special Information" on Hauser to all comers from the Morton Hotel at Grand Rapids in April 1926.

Hauser no longer uses the prefix "Dr." or the suffix "M.D."; he is content to be modestly known to his classes as "a nutritionist, a food scientist, a doctor of chemistry . . ." and admits: "I don't know beans about medicine. . . ."

If Hauser is a "doctor of chemistry" other than by self appointment, he failed in his class "announcements," distributed during his appearance at the Sherman Hotel, Chicago, in April 1936, to state from what academic institutions he acquired his knowledge of chemistry. Unless one is willing to accept the Hauser pronouncement that "Hauser's tremendous store-house of fundamental knowledge, coupled with the latest scientific facts he gathers each year in the great health centers of Europe . . ." is sufficient to confer on him the title "doctor of chemistry."

In his "lecture" at the Sherman Hotel on April 28, 1936, Hauser claimed to have attended the Chicago College of Naprapathy; his name did appear in the Chicago telephone book some years ago as a naprapath, although the records of the Department of Registration and Education of the State of Illinois do not show that Bengamin G. Hauser was ever licensed under the Illinois medical practice act for treatment of human ailments by any system.

Hauser is a personable-looking, youngish man with a leading-man stage presence and a flair for the Jack Pearl-Baron Munchausen type of dialect ("smashed potatoes" for "mashed potatoes").

Bengamin Gayelord Hauser first entered the United States, according to a reliable authority, in 1911, from Tübingen, Germany, as Helmuth Hauser at the age of 16, and joined his brother, Otto Robert Hauser, then pastor of a church in Milwaukee. Thereafter little is known of Hauser's activities except what he tells from the lecture platform. Hauser states that he was dying of tuberculosis of the hip at the age of 16, which we have learned was his age when he entered the United States. He claims to have been given up by several famous Chicago physicians and returned abroad for treatment. In Switzerland, by accident, he claims to have met an old physician who prescribed lemon juice. Voila! Hauser was cured after one or two weeks of lemon juice. However, recovery from tuberculosis or some other serious illness by means of a special diet

Photograph of Bengamin Gayelord Hauser from one of his announcements, 1936.

is a claim made by practically all health faddists. In regard to his lemon juice treatment, Hauser warns his audience not to take thirty-six lemons a day, as he did!

Eugene Helmuth Hauser, now Bengamin Gayelord Hauser by court order, states that 50 per cent of the world's pains and aches could be cleared up by sodium, potassium and calcium. Hauser is extremely careful in his announcements to call attention to the fact that "personal consultations or interviews cannot be arranged, and it is clearly understood that his work in no way enters that field which pertains to the diagnosis and treatment of individual conditions." Nevertheless, chemist Hauser has no hesitancy in prescribing from the rostrum for various ailments submitted to him by card.

Hauser has a diet for practically every ailment to which mortal flesh is heir. There is the "Mending Diet" (with menus), the "Vitality Diet" (with menus), the "Transition Diet" (with menus), and the "Zigzag Diet." It is recommended that the "Zigzag Diet," together with "Syn," a preparation of the Modern Health Products, be taken by the overweight.

The three trump cards in Hauser's healing deck are sodium, potassium and calcium. One trained in the orderly method of the presentation of the sciences will suffer a series of academic shocks in attempting to follow Hauser in the ways of calcium, potassium and sodium. As a lecturer Hauser is as elusive as a rabbit; when you are prepared for a pronouncement of scientific fact the thought suddenly evaporates and Hauser is gracefully tacking his healing ship into a new angle.

As the Hauser meeting warms up, it takes on that electrifying something found only in religious revivals. Various members of the audience get up and testify to strange and unusual occurrences. An elderly woman testifies that her hair has turned from gray to brown as a result of the Hauser diet. Hundreds of hands were raised when Hauser asked how many had been free from colds since his last visit.

Hauser has ready answers for every question submitted to him by card, such as that every ear noise is due to a lack of red blood. To the question "How can I gain 25 pounds and spread it evenly over my body, not putting it on in spots?" Hauser answered, "When you balance your meals correctly, you don't put on weight in spots."

In reply to the question "What is good for pyorrhea?" Hauser stated: "Pyorrhea means anemic gums. Take lemon and hot water half and half."

To the question "What can I do to improve my hearing?" Hauser replies: "Hard of hearing people have mucus in the ear. Dissolve the mucus, flush, cleanse. If the ear drum is alive, you can improve your hearing."

Hauser also advised his audience: "Never take a trip across the ocean without 'Swiss-Kriss.'" Swiss-Kriss also is a concoction of the Modern Health Products, Inc., and was the subject of a Federal Trade Commission stipulation released on June 25, 1936. A few of the statements which the Modern Health Products, Inc., agreed to discontinue in their advertising were "that the product is a 'modern laxative' or a 'secret' of the Swiss people or that the formula was brought from Switzerland by health 'authorities'; that it will 'up-build' the system or that the product is a tonic or that it possesses tonic properties."

In September 1934 the Food and Drug Administration prosecuted the Modern Health Products, Inc., for selling two other products—"Santay-Swiss Anti-Diabetic Tea" and "Nutro-Links"—under fraudulent therapeutic claims. According to the government chemists, the first-named product consisted of plant drugs including peppermint leaves and stems, malva flowers, senna pods and dog grass, and Nutro-Links was composed of powdered plant material, common salt and Glauber's salt.

Another question asked at the Hauser lecture was: "What is vitality and why do so many people lack vitality?" Hauser answered: "If you are fat and eat a lot of fat, then your gallbladder is overworked and your gallbladder takes up a lot of energy."

Many more examples of the Hauser vagaries could be mentioned, but those cited should give sufficient information as to the type of advice Hauser dispenses.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

SYPHILITIC AORTITIS

To the Editor:—I am treating a patient for a syphilitic aortitis and have been treating him in about the same manner in which one would any chronic syphilis. This treatment has been over a period of a year and has consisted of alternating courses of bismuth and mercury compounds and neoarsphenamine, without intermissions. Does syphilitic aortitis call for special or different treatment? Please give me an early reply and omit name.

M.D., Texas.

ANSWER.—Cardiovascular syphilis requires specialization in its treatment. The two points to be emphasized in the treatment of cardiovascular syphilis are the effort to preserve the heart muscle and prevention of the progress of the syphilitic involvement. The Cooperative Clinic Group has shown that in patients with uncomplicated syphilitic aortitis the results of treatment are superior to those obtained in individuals with complicated syphilitic aortitis in that in the former group the life expectancy can be increased by treatment from thirty-four to eighty-five months after detection while in the complicated type the increase in life expectancy is from forty to fifty-five months after detection. The special treatment for syphilitic aortitis includes first such measures as are indicated by the status of the heart. If signs of decompensation are present, rest in bed and the use of cardiac stimulants or sedatives is warranted. The antisyphilitic remedies in such patients should be limited to either mercury or bismuth compounds by intramuscular injection. These should be continued until compensation is reestablished, when small doses of arsphenamine may be given, preferably by the intramuscular route. Bismuth arsphenamine sulfonate or sulfarsphenamine is well suited for such cases. If neoarsphenamine is used intravenously, it is well to start with a dose of 0.05 Gm. and increase the dosage slowly. In the type of case mentioned in the inquiry, cardiac decompensation has apparently not been present, so that ambulatory treatment has been satisfactory thus far. As a general rule, however, it is recommended to start the treatment of all patients with cardiovascular syphilis with a bismuth or mercury preparation for at least a month before inaugurating one of the arsphenamines. Likewise, the physical activities of these patients should be restricted.

It is necessary to continue the treatment of patients with cardiovascular syphilis for a long time, and it is impossible to specify the number of injections of an arsphenamine or heavy metal preparation that should be administered in a given case because of the numerous factors that may influence such a decision. Chief among these, of course, is the progress, favorable or otherwise, which the cardiac lesion may show. In the case that responds favorably, small doses of arsphenamine in conjunction with either bismuth or mercury compounds should be given in courses twice a year for at least three years, following which courses of bismuth or mercury compounds alone should be given for three more years. Semiannual reexaminations are then warranted, as these patients are prone to have subsequent cardiac breakdowns. For the patients who progress unfavorably, the use of the antisyphilitic remedies is of secondary importance and when used should be given in small doses.

The ideal method of preventing cardiovascular syphilis is by the adequate and intensive treatment of early syphilis.

EXCESSIVE SWEATING AT NIGHT

To the Editor:—A man, aged 28, complains of severe night sweats and states that the odor of the perspiration is foul and rancid. He does not sweat during the day, although he does manual labor in an automobile plant. He is well developed and well nourished, is 68 inches (173 cm.) in height, and weighs 165 pounds (75 Kg.). Physical examination reveals no pathologic condition. His blood pressure is 118 systolic, 76 diastolic and the pulse rate is 72 beats per minute. His temperature is 98.6 F., without rise in the afternoon. There is no cough or expectoration. The Kline test is negative. Basal metabolism tests were made and the result was minus 4. Roentgenograms of the chest show the heart slightly enlarged and some evidence of an old healed pleurisy and slight chronic bronchitis. There is no evidence of tuberculosis. He has been given belladonna and potassium iodide solutions without any benefit. I would appreciate if you would aid me in the diagnosis and offer some advice as to further treatment.

M.D., Ohio.

ANSWER.—It seems that, of the ordinary causes of generalized hyperhidrosis, tuberculosis, rheumatism and hyperthyroidism have been ruled out. Anemia sometimes causes excessive sweating. A series of blood counts should be made with a differential count of the white cells and a sedimentation test. If anemia is present it should be treated with iron, arsenic or liver extract, as the type of anemia indicates. A rapid sedimentation test may point to some focal infection, which may be indicated also in the differential count.

In spite of a nonfebrile course and lack of an enlarged spleen, malaria may be suspected. The presence of secondary anemia with leukopenia may point to it, and a therapeutic test with quinine may be indicated, though of course not all that yields to quinine is malaria.

The negative Kline test and failure of improvement from potassium iodide do not rule out syphilis. Repeated Wassermann and precipitin tests should be made and the spinal fluid thoroughly examined.

The urine should be examined repeatedly, particularly for sugar, and the blood sugar should be estimated. Glycosuria is sometimes associated with hyperhidrosis. A thorough examination of the eyegrounds with a careful survey of the nervous system may reveal signs of dementia paralytica, myelitis, brain tumor or functional disorder as a cause of the excessive sweating. Finally the mental state of the patient must be studied. Neuroses due to fear may be responsible for hyperhidrosis.

A number of cases of self-limited generalized hyperhidrosis have been reported in which no etiologic factor could be found. The theory offered is that they were due to a temporary vasomotor disturbance in the corpus stratum or the hypothalamus consequent on some infection.

A study in the hospital is recommended. The amount of sweating and the odor can be noted. Neurotic patients often exaggerate body odors. The habits of the patient should be studied. Excessive drinking in the evening should be avoided. If no etiology can be discovered, symptomatic treatment must be used. Atropine and belladonna are seldom helpful because of the disagreeable by-effects. Stimulating baths, cold needle baths, alum, salt baths or alcohol baths are often helpful. Strychnine in stimulating dosage may be helpful.

DERMATITIS IN LEATHER WORKERS

To the Editor:—A man, about 23 years of age, single, complains of severe nervousness and a certain type of dermatitis, especially on the feet and hands, and the exposed part of the neck. The dermatitis of the hands and feet is similar to an eczema. He has had it for from six to nine months. He seems to be of a very neurotic type. He works in a glove factory and is working with leather ten hours a day. The question I wish to ask is: Is dermatitis caused by the handling of leather over a great period of time?

ROBERT WENDELL SHAW, M.D., Marinette, Wis.

ANSWER.—Yes, dermatitis is caused by the handling of leather. It is characteristic of sensitization that it may take place after long contact with the sensitizing material. However, manufacturing processes and materials are constantly being changed.

Dermatitis due to leather is not uncommon. In the preparation of leather, sumac, formaldehyde, chromic acid and tannin from myrobalan or quebracho are used in tanning, and ammonia or oxalic acid is used in finishing and polishing. Bismarck brown, chrysoidine and aurantia (emperor's yellow) are the dyes that give most trouble. Titanium chloride used as a mordant is very irritating.

Leather dressings may contain formaldehyde, mirbane oil, resins, white arsenic, asphalt, pearl ash, aniline, bismarck brown, oil of turpentine and possibly pine oils.

If it were not for the fact that most of these irritants are fixed, covered or removed in the process of manufacture, leather dermatitis would be much commoner than it is. The British Leather Manufacturers Research Association reported in 1932 that dermatitis due to leather was due probably to the presence of free chromic acid or to excessive amounts of water soluble dyes. This applies to shoes (London letter, THE JOURNAL, April 2, 1932, p. 1197). Glove leather is often tanned with formaldehyde. This may be the source of irritation in the case under discussion. Patch tests of the various substances that the patient handles should be made on healthy parts of the skin.

TACHYCARDIA WITH SYPHILIS

To the Editor:—In a man, aged 23, who was complaining of frequent headache, ostealgia, easy tiredness and tachycardia (with normal rhythm), it was discovered that the Kahn reaction was 4 plus. Physical and radiologic examinations were negative. An electrocardiogram revealed a hyperexcited myocardium without organic lesion. The basal metabolism and the blood cholesterol were within normal limits. He was then (June 17, 1936) given the following treatment: weekly injections for a period of nine weeks of 0.45 Gm. of neoarsphenamine and of 0.1 Gm. of a bismuth compound (Iodobisman). From Aug. 1, 1936, to Sept. 25, 1936, I gave him 1 Gm. of Iodobisman. September 28 the Kahn reaction was negative. At present he is very much better except for the tachycardia, which disturbs him very much. Now and then he has attacks of paroxysmal tachycardia. What do you think of these attacks and their treatment? Are they related to smoking? I should like to know what your opinion is regarding the kind of syphilis of this patient. He never developed a sore on the penis or elsewhere. I am most interested in knowing whether it is possible to get syphilis without catching an initial sore (chancre), i. e., d'emblée. Will you please outline the treatment of this patient. If it is congenital syphilis is the treatment the same as for the acquired form? What is the treatment for paroxysmal tachycardia in this case? Please omit name and address.

M.D., Brazil.

ANSWER.—Tachycardia due to syphilis is usually found in one of two situations. It may be present in the secondary stage when this stage is rather violent and associated with fever or it may be encountered in cardiovascular syphilis with mild or severe cardiac insufficiency. Neither of these conditions is present in this case, so it seems reasonable to doubt that the tachycardia and the syphilis are closely associated. This doubt is strengthened by the fact that the tachycardia was unimproved by the treatment, while most of the other complaints cleared up.

The causes of sinus tachycardia, and to a lesser extent of paroxysmal tachycardia, are multitudinous. Hyperthyroidism, the effort syndrome, and pathologic changes in the chest or abdomen include only a few of these causes. Both types of tachycardia are merely symptoms and it is unwise to treat any symptom if it is possible to ascertain the underlying cause. If the etiologic factor in the case of the paroxysmal tachycardia cannot be discovered or if it cannot be eradicated, the salts of quinine and quinidine have been found of value in preventing the paroxysms. It is most difficult to slow a sinus tachycardia by means of medication. Recently derivatives of acetylcholine have been used in both types of tachycardia; but the use of these drugs is not without danger and should not be lightly undertaken. Tobacco may produce tachycardia in sensitive persons but certainly is not a common cause of this phenomenon.

It seems likely that the patient has an acquired syphilis. Congenital syphilis usually makes itself known before the age of 23 years and the absence of a known initial lesion does not carry much weight with syphilologists of large experience. It is assumed that in most of these cases the initial lesion has been extragenital and has gone unrecognized. Intra-urethral chancre is another source of confusion.

The use of the term "infection d'emblée" is ordinarily confined to those cases acquired by contamination with a syphilitic blood. This occasionally happens in blood transfusion, at the operating room table or at the necropsy table.

Whatever the source of the infection, there can be no criticism of the treatment carried out here. It should of course be followed up at suitable intervals and an examination of the spinal fluid should be considered before a complete arrest is assumed.

TOXICITY OF METHYL CELLOSOLVE

To the Editor:—Will you please state whether the fumes produced by mixture of methyl cellosolve with 80 per cent grain alcohol will produce any deleterious effects on the lungs of working people.

MURRAY BERGER, M.D., New York.

ANSWER.—Monomethyl ether of ethylene glycol is readily prepared by treating ethylene oxide with methyl alcohol in the presence of a suitable catalyst. The cellosolves, of which there are several, are useful solvents, as they at the same time partake of the properties of alcohols and of ethers. For this reason they readily dissolve a variety of organic substances. Because methyl cellosolve is derived from methyl alcohol and retains some alcoholic properties, it might be assumed that this substance is physiologically akin to its progenitor, methyl alcohol. Such is not the case and such alcoholic properties as are displayed by methyl cellosolve more closely resemble ethyl alcohol than the methyl variety. Reference may be found to the toxic properties of cellosolves in the *American Journal of Public Health* (**19**:525 [May] 1929). A more extensive discussion appears in *Public Health Reports* (**45**:1459 [June 27] 1930). However, this material is more closely related to ethyl cellosolve than to the methyl. This report is based on an experimental study from which it was determined that cellosolve vapors to the point of air saturation produce only a disagreeable odor, together with moderate eye and mucous membrane irritation. The statement is made that no indications were observed suggesting the possibility of chronic poisoning from ethyl cellosolve. While no large amount of data are in hand specifically referable to methyl cellosolve, there is no reason to believe that, in a mixture with 80 per cent ethyl alcohol, any marked deleterious effects on the lungs of workers are to be expected. Ethyl alcohol itself is not an entirely innocuous substance. As used in industry it is comparatively innocuous. It is believed that the presence of methyl cellosolve along with 80 per cent ethyl alcohol will give rise to no additional manifestations other than a moderate degree of local irritation.

NODOZ ANTISLEEP REMEDY

To the Editor:—Air line pilots have had recommended to their use a product known as "NoDoz" as a means of combating a tendency toward sleep. Will you please advise me of the formula of this product. Also is any medicinal agent, other than citrated caffeine, recommended as a means of staying awake?

M.D., Florida.

ANSWER.—Some tests of a specimen of NoDoz made in 1934 indicated the presence of caffeine and an organic acid, probably citric. No other alkaloids were found. It was concluded that the tablets contained essentially caffeine citrate.

Misrepresentation of the therapeutic value of NoDoz Awakeners was charged by the Federal Trade Commission at Washington in a complaint issued against the NoDoz Laboratories, Inc., of Sacramento, Calif., on June 18, 1936. Among the representations cited by the commission were the respondent's alleged claims that NoDoz Awakeners are a pure vegetable concentrate and are used by more than a million automobile drivers, which claims, the complaint charged, were false or exaggerated.

Ephedrine, benzedrine and cocaine are other alkaloids that have a tendency to produce wakefulness; and their use, by reason of this tendency, should generally be avoided at bedtime.

POSSIBLE CANCER OF STOMACH

To the Editor:—A white woman, aged 49, housewife, nulliparous, seems to have a malignant growth of the stomach. On examination, the only positive pathologic conditions were a uterine mass the size of a grapefruit palpable superficially, with subserous fibroids vaginally and tenderness in the epigastrium. A hysterectomy was performed, and exploration of the abdomen revealed pathologic changes on the posterior wall near the cardia that appeared to be a malignant growth with possible glandular involvement; but the surgeon was unable to remove any tissue for biopsy because of the incision being too low down. Three weeks later the patient still complained of symptoms referable to the epigastrium, although occasionally to a lesser degree as compared to those before the operation. The surgeon wants to do a gastrectomy or whatever is feasible when the abdomen is exposed again. However, I fear a fatal outcome sooner than if a "hands off" policy is followed (perhaps with irradiation). The physical condition of the patient in general is good with exception of the blood pressure, 160 systolic, 100 diastolic. What is the wisest policy to follow, surgery or not? What treatment should be given then and what is the prognosis in either case? Kindly omit name if published.

M.D., New York.

ANSWER.—If examination by a competent roentgenologist confirms the diagnosis of malignancy to the exclusion of gastric syphilis, benign tumor and diaphragmatic hernia, one can hope to accomplish little by further surgical intervention. Inaccessibility of the lesion, and the prohibitive surgical mortality following subtotal or total gastrectomy, argue strongly against further operation. The prognosis under any circumstance is unfavorable, granted that the lesion is a malignant one. The treatment is largely symptomatic and palliative, although high voltage roentgen therapy might be carried out.

EPINEPHRINE IN PROGRESSIVE MYOPIA

To the Editor:—I wish to inquire into the use of epinephrine in the treatment of progressive myopia. I would be pleased to receive information on the length of treatment and on the dangers and contraindications of such treatment and finally on its apparent value. Please omit name.

M.D., Minnesota.

ANSWER.—The use of 1:1,000 epinephrine in the treatment of progressive myopia was introduced by Dr. Meyer Wiener of St. Louis and has been discussed in subsequent communications by various authors. In such cases epinephrine is used as drops into the conjunctival sac three times daily for long periods, at least three years or more, depending on the age of the patients. There appear to be no dangers or contraindications. The only untoward result appears when the solution becomes too old or becomes contaminated, especially by air fungi. The treatment appears to be of greatest value in young patients from between 8 and 12 years of age to early adolescence.

It is impossible to state absolutely whether or not the use of epinephrine arrests the progress of so-called progressive myopia, just as it is equally impossible to determine a priori whether any one case will progress or not. But in various series of patients of similar age and with like amounts of myopia there was definitely less progress in the myopia when epinephrine was used faithfully.

ENDOCRINE PRODUCTS FOR TESTICULAR DEVELOPMENT

To the Editor:—What is the status of endocrine products to develop small genitalia in a 9 year old boy? Both testes have descended. Please omit name.

M.D., California.

ANSWER.—There may be a question whether or to what extent artificial means should be directed toward enlarging the genitalia in a 9 year old boy whose testicles have descended. Aside from this question the general problem is still in the experimental stage, particularly as concerns the human being. The two means available for hormone stimulation of the accessory reproductive organs in experimental animals are (1) the injection of pure chemical extracts such as androsterone or testosterone (now prepared by synthetic means) and (2) the injection of gonadotropic agents to stimulate increased male hormone secretion by the intact testicle. Substances having these properties and prepared from human pregnancy urine or pituitary tissue are available for therapeutic use. It has been shown on experimental mammals that injections of androgen into the normal young growing animal has a decidedly retarding and injurious effect on the intact testicle. Continued injections of gonadotropic substances have been shown conclusively to stimulate testis hormone secretion in the experimental mammal and the reports of results from clinical applications, especially in cases of testicular undescent, have been favorable in some cases. Such treatments are yet too few, and the results reported too uncritically weighed, to offer convincing indications of the efficacy of the measures adopted. A definitive answer to the question cannot be given at present.

NEEDLING OPERATION FOR CONGENITAL CATARACT

To the Editor:—I have two patients, aged 6 and 10 months, with congenital cataract. I would like your opinion as to the best time to do a needling operation. Since I have never operated on any patients this young I would like some one else's opinion as to the advisability of operating right away. Please omit name.

M.D., Virginia.

ANSWER.—The age at which congenital cataracts should be needled depends to a great extent on the character of the condition. If the lens opacities are accompanied by congenital miosis, it is not wise to attempt any operative procedure before the age of 6 years. But if the iris is normal and the pupil can be dilated widely, needling may be performed any time from the age of 18 months upward. There need be no fear that there will be failure of retinal development from lack of use by postponing the operation; on the contrary, there is no need of operating until the child is old enough to wear correcting glasses.

PERSISTENT PAIN AND EDEMA IN WRIST AFTER TRAUMA

To the Editor:—A woman, aged 25, injured her right wrist in the subway rush hour about two years ago by having it pinioned against a door post. Persistent pain followed this, accompanied by slight swelling of the fingers. The pain extends from the wrist to the fingers and is increased with edema when the fingers are used for such work as typing. For the past six months the patient had been symptom free until two days ago, when in getting off a chair she leaned heavily on her right hand and symptoms are again returning. The past history is negative; x-ray examinations on two occasions have been negative for fracture. What do you think is the diagnosis and treatment? Please omit name.

M.D., New York.

ANSWER.—Repeated x-ray examinations that are negative for fracture are not sufficient and the data are inadequate to make a diagnosis or advise treatment.

What about the calcium content of the bones? Is there demineralization or osteoporosis? This case may be in the classification of osteo-articular-vascular-neurogenic lesions. The present attack may be a mild recurrence. There may be a malacia of the carpal bones. Foci of infection should be investigated. Some of these patients do well on occupational therapy and some require sympathetic denervation. Excellent literature on this subject will be found in articles by Clarence H. Heyman of Cleveland, Gurd of Montreal, Leriche and Fontaine of France and R. Watson Jones of Liverpool.

PEPSIN SECRETION OF LOWER ANIMALS

To the Editor:—I should be greatly obliged if you could inform me whether the stomachs of the calf and cow are known to secrete any pepsin. If they do contain pepsin, could you let me know whether any of the larger animals (domestic) secrete a pepsin-free gastric juice? I should also be grateful for any references on the gastric physiology of these animals. Please omit name.

M.D., Canada.

ANSWER.—Pepsin seems to be normally present in the stomach secretion of all species of vertebrates, certainly from the amphibians up. There appears to be some uncertainty as to the character of the gastric enzyme in fishes. In the ruminating mammals, pepsin is secreted in the last division or true stomach. Of course not all vertebrate species have as yet been examined for gastric pepsin. As to gastric pepsin in calves, the pepsin and the hydrochloric acid of the gastric juice appear at or shortly before birth, in those species so far studied.

HYPERPYREXIA FOR TREATMENT OF GONORRHEA

To the Editor:—We note in Queries and Minor Notes of March 27, 1937, the report of a case of chronic periurethral abscess with persistent presence of gonococci. In the reply to the query concerning treatment, it is stated that artificial fever therapy is rather heroic treatment for this condition, and further local treatment is recommended. A persistent gonococcic infection of fifteen months' duration is by no means a trifling affair, especially as far as the patient and his possible contacts are concerned. This patient has been offered rational local treatment, but the infection still persists. Hyperpyrexia in experienced hands conducted under control of a physician doing fever therapy has proved its merits in eradication of gonococcic infections. It is now time to correct the general impression that hyperpyrexia is heroic treatment. As this form of therapy is today conducted, it is neither dangerous nor debilitating. Since all workers in artificial fever therapy report from 88 to 92 per cent cures in all types of gonorrheal infections, this therapeutic measure should be definitely encouraged in persistent gonorrheal infections.

J. M. BERRIS, M.D.
M. K. NEWMAN, M.D.
Detroit.

Council on Medical Education and Hospitals

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

Thirty-Third Annual Meeting, held in Chicago, Feb. 15 and 16, 1937

(Continued from page 1291)

DR. JAMES N. BAKER, Montgomery, Ala., in the Chair

JOINT SESSION OF THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS AND THE FEDERATION OF STATE MEDICAL BOARDS

FEBRUARY 16—MORNING

SYMPOSIUM ON THE SELECTION OF STUDENTS

Primary Mental Abilities

L. L. THURSTONE, PH.D., Chicago: While the complex known as intelligence is very useful in differentiating those who are generally bright and those who are less endowed, it is of great importance to isolate those elements of intelligence which are in some fundamental sense primary. Common experience supports the view that such differentiable types exist and that mental endowment cannot be adequately described in terms of a single index. This problem has been the subject of speculation for centuries, and every writer has been at liberty to set up his own classification and to argue for its acceptance. A scientific treatment, on the other hand, demands that the elements of intelligence be demonstrated by objective experimental methods.

Scientific work that has been in progress for the past four years has revealed seven primary mental abilities. While future investigation will refine our present ideas about each of the primary abilities, it is possible already to describe the general characteristics of seven of them. The present list of seven primary factors was isolated by the application of factor analysis to the records of 240 college students who volunteered fifteen hours of work in taking fifty-six psychologic tests. One of the most conspicuous primary abilities that appeared in these experiments was number facility. This primary factor is entirely restricted to numerical thinking and it is present in the highest amount in simple numerical speed tests. It is less conspicuous in those numerical tests which involve reasoning or formulation of a problem in quantitative terms. Another primary ability conspicuous in these experiments is word fluency. A test of anagrams has a large component of this ability. In one of the best tests for this factor the student is asked to identify words that are presented with their letters in disarranged order. Another similar task is to write as many words as possible that have the same general meaning as some given word. The visual material in these experiments was adequate for the isolation of a primary ability of visualizing. As far as can be determined at present, this factor includes the visualizing of solid objects as well as flat space. Again there seems to be experimental justification for describing some persons as visually minded. A distinct memory factor was revealed in the analysis. The memory tests were varied in content so as to involve memory for names, words and numbers, and tests were included in order to ascertain whether recognition memory among distractors would reveal several memory factors. The conclusion seems warranted that a person can be described as having a good memory in general without specification as to what he can remember well. One of the seven primary abilities has been called perceptual speed. It is prominent in those tests in which the subject is asked to identify something quickly when it is mixed with other perceptual material. In one of these tests the subject is shown a figure with some detail of design. He is also shown five others that differ but slightly and he is asked to pick out the design that is an exact duplicate of the given design. This is the ability that enables some people to scan a page of names or numbers to find a particular item quickly while others must examine each item separately. A most interesting primary ability that has appeared in these experiments is one that has been named induction. It is involved in several tasks which have in common the characteristic that the subject must discover some principle or rule that governs the material. Another primary ability has been named verbal reasoning. It is exemplified by tests of verbal analogies and tests in which the subject is asked to match proverbs which have the same moral or quotations which have the same meaning, and to make numerical estimates which require deductive reasoning.

The practical result of these tests is that individuals can be appraised as regards each of the primary mental abilities. Instead of describing a child or an adult by means of a single index of intelligence, the description will be in terms of at least seven indexes which can be graphically represented on a diagram in a sort of profile. The ups and downs on an individual's mental profile show the primary abilities in which he is gifted and the abilities in which he is not gifted. Such a description is in line with common observation about people according to which they differ not only as to a single average mental level but also in the diversity of individual talent.

In vocational and educational guidance, the mental profiles will play an important rôle. Children may be divided into separate groups in the schools in accordance with their mental profiles and taught to read, for example, by methods that are appropriate to their respective imagery types. An engineering student who is relatively deficient in visualizing will be warned beforehand of his difficulty with descriptive geometry. The medical student who is relatively low in memory will know beforehand that he will have to give special effort in learning anatomy. Unsuspected talent might be discovered by rating people on each primary element of intelligence.

One of the most fundamental educational problems is to determine to what extent these primary abilities are native and to what extent they can be trained. If it should be found that some abilities can be trained, school curriculums might be fundamentally altered. It will be of great social interest to ascertain which abilities are determined by inheritance. Since the primary mental abilities have so recently been isolated, there must be several years of intensive research before the appropriate tests can be made generally available for all ages. Further experimental studies must also be made in refining our conception of the primary abilities.

Measurement of Personality

EDWARD K. STRONG JR., PH.D., Stanford University, Calif.: There are two major problems in the selection of students for a medical school. First there is the problem of selecting applicants who will do satisfactory scholastic work in school. Second there is the problem of selecting applicants who after graduation will be successful practitioners, enjoy their work and be a source of pride to the profession. This paper is primarily concerned with the problem of selecting students who will make good in actual practice after graduation. Here a wide variety of factors needs to be taken into account. Consideration should be given to such characteristics as honesty, willingness to work, faithfulness in performance of duty, lack of tendency to get drunk, and the like. Without such qualities a man cannot be trusted and hence will not be employed even though he did fine scholastic work in medical school. Consideration ought also to be given to those aspects of personality which will win clients and the cooperation of colleagues.

One approach to this problem of selecting men for a profession who will enjoy their work throughout life is through the use of the vocational interest test. This is a test of what one likes and dislikes. It is not a measure of intelligence. Certain general conclusions can be stated following thirteen years of research and the analysis of thousands of records of men in more than forty different occupations. First, adult men engaged in a particular occupation have a characteristic pattern of likes and dislikes which differentiate them from men engaged in other occupations. Second, occupations can be grouped according to the similarity of the interests of the men engaged in those occupations. Third, these occupational interests are not the result of experience from working in the occupation, for college men and high school boys possess such

interests before they have had any actual experience in the occupation or even in many cases before they have studied the subject.

Each of our 285 college seniors has been assigned to the single occupation in which he rates highest. On this basis it is found that 4.6 per cent of these college seniors have more distinctly the interests of physicians and surgeons than any other among twenty-seven occupations. These percentages must be viewed as tentative, but they suggest that there are enough young men definitely possessing the interests of medical men to fill the medical schools.

The interest test purports to differentiate those who have the interests of successfully employed men in a given occupation from those who do not have such interests. And the claim is made that the former are more likely to enter the occupation and continue in it than the latter. If a professional school is desirous of securing students who will continue throughout the entire course, it should see to it that students have the ability to do the work and the interest to continue in such studies. Too many educational institutions are interested primarily in filling their classes with students and are little concerned with whether those students belong there or somewhere else so long as the students obtain sufficiently satisfactory grades and continue on to graduation. Should not every educational institution be primarily concerned in directing students into the pathways which they are best fitted to follow? From the data in my possession it is clear that if this should be done there would be a considerable interchange of students, with the result that many more students would be trained for the occupation they are best fitted to follow and educational institutions would have fewer misfits in their specialized training courses.

We are in no position to carry out such a program in a thoroughgoing, efficient way because we lack the measuring devices which are necessary for determining individual fitness. A beginning can be made, however, employing the devices which we now have at our disposal. The vocational interest test is such a device. If it should be given, for example, to all college students in their sophomore year, some now heading for medicine would be encouraged to try something else and some not now considering medicine would enter the profession. The interest test can possibly be used as a selective device in considering applicants for admission to medical school. It should be tried out in this connection on an experimental basis. The danger to guard against is the fact that students can fudge the results if they wish to do so, unless possibly they are required to take it in a designated minimum time. But the real place to use the interest test is when students are honestly trying to make up their minds what they should do. Under these conditions they give honest responses to the test items.

The Why, What and How of the Medical Scholastic Aptitude Test

DR. TORALD SOLLMANN, Cleveland: The tests devised by Dr. F. A. Moss, which have been given nationally for several years by a committee under the auspices of the Association of American Medical Colleges, aim to test a student's ability to master the study of medicine, to appraise his chances of getting through the medical school, and to forecast whether he is likely to rank as an outstanding, a good, a fair or a poor student in medicine. The test does not pretend more than this. Granting that it is desirable to know the medical scholastic aptitude of the applicants in order to select them, is it necessary to institute a special test for it? The applicant has been studying at a college; could not the college tell us all about his scholastic aptitudes or ineptitudes? Do not his grades tell the story. Sometimes they tell it very well indeed, better than any test; sometimes they tell it not very well and sometimes not at all, or they may even distort it out of all recognition.

It may be just, but it may also be unwise, to close the door automatically on account of college grades which may be the result of faults of judgment of a youth who has not yet found himself; it may be an undeserved calamity to him, and perhaps to humanity, for some good material will certainly be discarded. Linnaeus, I believe, was expelled from secondary school for stupidity, though with the saving grace of a "hope that, like some trees in a nursery, he might thrive better after transplanting." The scholastic aptitude test gives the student a final chance to show whether his low grades were caused by something else than native ineptitude. At the same time, it helps to nail lame excuses, so often heard and so difficult to answer, that the grades would have been quite different if this, that or the other. If low grades and low aptitude test ranking coincide, there remains no room for alibis. It is in the middle group, however, in which an additional test is especially necessary to separate the collegiate sheep and goats. The case is somewhat parallel to diagnosis in medical practice. The extremes of illness and health can generally be diagnosed satisfactorily by the direct physical signs, but not always, and laboratory tests and x-ray plates will pick up something important here and there that would have been missed without them; and whenever the older methods leave room for doubt, and especially for prognosing and comparing intermediate cases, the physician would use every means available to him and not be content with a method that amounted to a 50 per cent probability, if this could be checked by another method of examination. The best diagnosis is not furnished by any single method but by the checks and counterchecks of several independent methods.

What is the Moss test? How does it manage in two hours to give a generally reliable estimate of a student's ability for the study of medicine, more reliable on the whole than his two, three or four years of college grades? The test approaches its problem from several rather distinctive angles. First it tries to depart from the beaten paths of course examinations, so that it cannot be prepared for, at least directly. It aims to sound what is left of the previous knowledge and experience of the student after most of the forgetable things have been forgotten. Through this it aims to reach the student's real interests and his power of selection for these. Then it aims to test the ability of the student to apply his knowledge remote from its usual context and thus again to distinguish what has become a part of the student from that which became part of an animated phonograph. At the same time, this tests the ability of the student to face new situations on his own. Then again it sets certain rather difficult study tasks, not requiring any previous knowledge of the subject but testing the ability to handle the sort of tasks with which the medical student is faced; and, finally, the whole test is a test of the ability to work under some pressure, which is so necessary in the study of medicine. These are broadly the distinctive aims of the test, and their application is checked every year by Dr. Moss and his staff by comparing the correlation of the several parts of the test with the grades of the students in the medical school, and the different parts of the test are then given more or less weight, or dropped, according to how they pass this test of achievement. New approaches are introduced tentatively and tested, retained or abandoned in the same manner. In this way it is hoped to make the tests ever better and to keep them from becoming stereotyped.

It should not be expected that the testing of men by men will ever be perfect. The genius of men differs in all things, and aptitude tests are no exception. They are meat to some and poison to others. Some men have a special knack for working out puzzles and like them, and others abhor them. The good correlation of the aptitude test with premedical and with medical grades shows that personal reactions are not generally serious; but when they are material in an individual case, this is of course shown by a sharp divergence of college grades and aptitude test, so that the admission officer may look into the matter and make his decision with this in mind. Previous practice in taking the aptitude test generally brings some improvement, but the official rating of the applicant shows whether he has taken the test before, and the grades can then be compared and the "practice improvement" discounted. Efficient proctoring is the only protection. Special training for the aptitude test is nearly akin to cheating, since it aims to secure an unfair advantage over other applicants.

No one, I imagine, has ever seriously proposed to use the aptitude test as the sole criterion for the selection of applicants. It is merely one factor in the diagnosis and prognosis. Even for scholastic aptitude it should be appraised with an eye to the college grades; and, when these together indicate the ability of the applicant to master the study of medicine,

other factors which play an important part in the practice of medicine must be considered, especially character and the features generally grouped as "personality and background." Until a method is devised of expressing the quality of a competent, conscientious practitioner in mathematical terms, conclusions must be based on sense and logical deductions.

DISCUSSION ON THE SELECTION OF STUDENTS

DR. IRVIN D. METZGER, Pittsburgh: We have had this morning a discussion from the point of view of the psychologist and the educator, who start and predict the likely person, the possibilities of the young man. The secondary schools are attempting to do that all over the country at present. It is interesting to those who catch these people after they have been trained, apparently, for the work which they are to do. Somehow, it is felt that many of them have not been touched quite as they should have been to make the best type of practitioners. There has been a misfit somewhere. I suspect it is in the personality rather than in the training. Personality is a very difficult thing to determine. So it is in the matter of education. Certain personal factors that are sure to crop out cannot be evaluated. I think the matter of interest has a great value, however, in any line of study. In the older cultures, as they exist in Europe, the young man or young woman is apt to follow the type of life which the parent has followed. That is not true in America; in fact, it seems in America to be the opposite. The technic of finding out whether a man will make a good physician, even when he comes before the state board, is inadequate.

DR. T. E. BROADIE, St. Paul: Three general characteristics are extremely important: first, intelligence. There are many ways in which one can learn about a student's intelligence. The second is character. Every one knows pretty well what is meant by fine character. The third is personality. This is the most indefinite and difficult characteristic to evaluate. A personal interview with the committee on admissions, preferably at the school, or meetings arranged elsewhere if necessary, is extremely important. If these meetings are informal, it is extraordinary what unusual matters may be found out in the course of half an hour's interview.

DR. FRANK M. FULLER, Keokuk, Iowa: Men and women of the highest grade of intelligence, the greatest aptitude for accomplishment, may go through the medical course, but if those men and women go out into the community without the qualities of honesty, integrity and moral stamina they will never make good physicians. I believe that in all our tests, as has just been said, a personal interview gives a better idea of the quality of the man. The man who will go out into the community and act fairly and act justly and act rightly will be the man who should be selected as the possible student and practitioner of medicine.

DR. TORALD SOLLMANN, Cleveland: The matter of character, of course, is really important. It did not happen to be a part of this morning's program. I am sure that the personal interview is the most efficient method of appraising. I think our experience has been that on the whole we tend to learn more by the appraisals of the man under whom the student has been in college than we can learn from the interview, although it is not, of course, without value.

SYMPOSIUM ON TECHNIC OF EXAMINATIONS

Philosophical Comments on Examinations

DR. HOWARD T. KARSNER, Cleveland: This article was published in full in THE JOURNAL, March 27, page 1022.

Fundamental Purposes, Methodology, and Technics of Examining in Relation to Medical Education and Licensure

BEN D. WOOD, PH.D., New York: The fundamental purpose of medical examinations is to secure information about individuals which will enable us to judge their suitability for admission to and promotion in medical schools, and for admission to medical practice. Medical education is a privilege which should be accorded only to those who have the ability and character to be worthy members of the profession and faithful servants of both the sick and the well. The funds for medical education are so inadequate, and are invested with such a crucial public interest, that any waste of them on incompetent or unsuitable students is a social loss which multiplies itself as time goes on. If such wastes are knowingly allowed for any reason, or even if they result only from negligence, a social crime has been committed which is incompatible not only with the Hippocratic oath but also with the ordinary rules of decent citizenship. If such negligence proceeds to the extent of licensing candidates who are incompetent because of either intellectual or moral deficiencies, a crime is committed which, at least potentially, is nothing short of heinous and revolting. On the other hand, it has been asserted by some authorities that good medical men are so rare that the exclusion of even one good man by unduly severe standards would entail a potentially great loss. But since one incompetent or unfaithful doctor can do more harm than ten can prevent or repair, let us err, if at all, on the side of humanity and the integrity of the profession, rather than endanger both for the sake of a few doubtful candidates.

The devices and methods now commonly used for selection are inadequate, and better ones are available if we would make the adjustments required by them. In common with most other professional colleges and licensing boards, those concerned with medicine have taken the matter of personnel selection rather lightly, not to say nonchalantly. They have more or less passively accepted traditional devices and methods. Technical advances in the construction and interpretation and use of examinations have been largely ignored and in some cases denounced. The obvious inadequacies of traditional devices have led to some discussion but not to any systematic or organized research in the field of medical aptitudes, achievements, interests or personal characteristics and methods of identifying and measuring or describing them. This is surprising, because medical diagnosis and medical case records have for many years served as an inspiration for workers in the field of educational and vocational guidance. We need educational, intelligence and personal and moral diagnosis comparable with modern medical diagnosis if we are to improve the selection of candidates for medical education and practice. This is a high ideal which will not soon be reached, but we can move toward it if we can catch the spirit and adopt the methodology that have led to the remarkable triumphs of modern medical diagnosis. The devices and examinations now used by colleges and boards are not nearly as accurate as the clinical thermometer and stethoscope, and even if they were as accurate they would no more be adequate to meet the admission and licensure problem than the thermometer and stethoscope alone would be adequate to meet the diagnostic problems of the general hospital of a large city.

The examinations now generally used in medical colleges and by licensing boards suffer from several technical inperfections: 1. Subjectivity. The examinations are almost exclusively of the essay-writing type. As usually employed, the written examination is highly subjective, from the selection and wording of the questions through the process of evaluating the answers and interpreting the resulting grades. 2. Inadequate sampling of materials and performances. Since the student must write out his answers in long hand and since only a few pages can be written in examination periods of normal length, the sampling of the materials on which the examination is based is necessarily narrowly limited. Since the number of questions is limited and each represents a large percentage of the total score, chance elements play a large and often decisive part in determining the final score. Since writing is in some degree a special art which involves abilities and habits often irrelevant to the purpose of the examination, and since students, like their examiners, vary from day to day in their effective writing, and since only a few brief samplings of the students' writing are secured, several additional chance and irrelevant elements are often present in vitiating degree. These weaknesses, plus the subjectivity of the rating, are the main sources of the low reliability and low validity of the traditional types of examinations as traditionally administered. 3. Statistical unreliability. Most if not all studies of the essay-type examination agree in indicating a relatively low statistical reliability.

Objective types of examinations which are carefully made usually show much higher reliability, unit for unit of examination time. 4. Low validity. The most serious consequence of all these technical defects is the generally low validity of the essay or written examination as normally used. Essay examinations constructed by the same examiners and designed to measure the same functions in the same pupils do not usually agree more than 50 per cent better than chance, even when allowance is made for their statistical unreliability. Even carefully made college entrance examinations in English, in which the written examination would appear a priori to be at its best, rarely predict a whole year of college grades in English more than 10 or 20 per cent better than chance. 5. Lack of comparability. Another serious defect of the traditional examination, as generally used, is the lack of comparability in the resulting grades or percentage scores. The questions, chosen subjectively, vary enormously in their difficulty, and the standards by which the answers are evaluated vary from reader to reader, and from day to day in the same reader.

I make these strictures on the traditional examination only as it is traditionally and generally used. Most of these defects can be greatly reduced or eliminated by careful procedures such as those used in recent years by the College Entrance Examination Board and by the Board of Examinations of the University of Chicago. Thus what I have chiefly denounced here is not the old-type or essay examination per se but rather the traditional misuse and misapplication of the written examination and the failure to use supplementary types of tests both for their intrinsic advantages and for their value in minimizing the defects of the written type of examination.

As in other educational institutions, the first duty of the medical college is not to teach but to learn students—to learn whether they belong in medical college and, if so, what specialties they might best pursue, if any. That this first duty has not been satisfactorily discharged by higher institutions generally is indicated by the high and increasing academic mortality rates in our colleges of liberal arts, of engineering and of law. The traditional examinations have not merited the confidence which we have reposed in them. The objective forms of tests will by no means furnish panaceas for all the maladjustments in our educational system, but that they are capable of giving us more exact and more meaningful information about our students than the traditional examinations alone has been demonstrated beyond reasonable doubt.

The Essay Examination "On the Spot"

DR. ROBERT P. DOBBIE, Buffalo: A recent survey made by questionnaire, to which seventy out of seventy-five universities responded, indicates that sixty-four of these seventy schools, or 92 per cent, use written final examinations either alone or combined with oral examinations in the senior year of the medical school. It was also learned, from the information furnished by sixty-one of the responding schools, that fifty-eight, or 95 per cent, use examinations made up for the most part of essay or "discuss" type questions. One concludes, therefore, that the usual written final examination given in most medical schools as well as by the national and state boards of examiners, is generally made up of varying numbers of essay or "discuss" type questions. It is my observation that the essay or "discuss" type questions are, as a rule, poorly designed; furthermore, frequently the same questions are repeated with slight, if any modifications, year after year. They are extremely narrow in their scope and many of them are poorly worded, requiring indefinite, lengthy answers which are extremely difficult, if not impossible, to grade or rate. The essay question gives the student the opportunity to write for an indefinite length of time on a subject he may know little or nothing about. Any one who has had the opportunity to examine these examination papers thoroughly appreciates the difficulties encountered in going through page after page of illegible writing, hoping to find, and recognize, points which the question was supposed to bring out. One often finds, if anything at all, a maze of impressions scattered amidst much irrelevant discussion. Some facts, though accurate, are later voided as the student rambles on, trying to get in every possible thought which he considers even remotely connected with the subject.

The experienced examiner has also realized how the severity in grading answers to the essay question varies, not only with different examiners, but with the same examiner, according to circumstances. That these difficulties and many others are actual, not merely hypothetical, has been proved many times in the college of arts and sciences and now for the first time, or again, in a college of medicine.

A study was carried out last year in the Medical School of the University of Buffalo, where, for the past four years, I have been acting as chairman of the examination committee. Sincere efforts to grade reliably 128 essay question manuscripts (submitted by sixty-four students) by eight competent examiners proved futile though a greater than usual attempt at unified estimation was made. The grades assigned by the individual examiners were studied and compared in two departmental groups, each comprising four examiners, as well as in one group of eight examiners.

Grading of the same manuscript by four different examiners resulted in a tremendous variation of grades. The point spread between highest and lowest grade assigned each manuscript was more than ten points in 60 per cent of instances and more than fifteen points in from 35 to 50 per cent of instances, depending on which group of examiners is considered. The grade variation of the two groups of examiners (four each) was manifested in no lesser degree, and correlation between the two groups was conspicuous by its absence. No relationship between the two questions is suggested, though they are both important medical subjects.

Examiners grading the same batch of manuscripts after several months' lapse of time showed tremendous variation in their own grades, which completely changed the status of a sizable proportion of the class.

Reliability in grading was in no way improved by grading in groups instead of by percentage grade.

Forty-four, or 60 per cent, of the class of sixty-four students were questioned or failed by one or more of the eight examiners, but, on analysis, practically all were unjustified if the consensus (of all participating examiners) was used as the determining factor.

In this demonstration, at least, it is shown quite conclusively that the resultant grades on manuscripts written as answers to typical essay or "discuss" type medical questions are thoroughly unreliable and are of little or no use in determining the general ability of a student on either an individual or a competitive basis.

Because of the marked variation in assigned grades shown among the examiners of the same department as well as between the two departmental groups of examiners, it is concluded that the more examiners participating, the greater the confusion and the more impossible it becomes to arrive at a valid estimate of the knowledge displayed in a given manuscript.

It is the purpose of this demonstration to discredit an examination system which is in more or less universal use throughout the medical schools. Such a system, because of its significance and power, should certainly be reliable and as nearly above criticism and the influence of chance as possible. I believe that the exact opposite has been shown to be true. I believe that the usual written essay question in use today is most unreliable and should be condemned. If it has any use at all, marked modification or change in design seems imperative. If reliability in grading cannot be assured, it should be abolished. At the University of Buffalo for the last four years we have used a better type of examination, which has received the enthusiastic endorsement of both students and faculty. It is, in our opinion, a superior examination in that it is more comprehensive as well as inclusive. Consisting entirely of short answer, "objective test" questions, it requires in the answering a maximum amount of thinking with a minimum amount of writing. The ability to judge knowledge and judgment, as well as the power of correlation and interpretation, is not sacrificed. It must be, and is, designed with the greatest of care and takes months in preparation. This is compensated for, however, in the fact that is can be graded quickly, easily and reliably.

(To be continued)

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 22-24. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARKANSAS: *Basic Science.* Little Rock, May 3. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock. *Medical (Regular).* Little Rock, June 17-18. Sec., Dr. A. S. Buchanan, Prescott. *Medical (Eclectic).* Little Rock, May 11. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Reciprocity.* San Francisco, May 9. *Examinations.* San Francisco, June 28-July 1, and Los Angeles, July 19-22. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

CONNECTICUT: *Basic Science.* New Haven, June 12. *Prerequisite to license examination.* Address State Board of Healing Arts, 1895 Yale Station, New Haven. *Medical (Homeopathic).* Derby, July 12. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven. *Medical (Regular).* Hartford, July 13-14. *Endorsement.* Hartford, July 27-28. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden.

DELAWARE: Dover, July 13-15. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, Dover.

DISTRICT OF COLUMBIA: *Basic Science.* Washington, June 28-29 (probable dates). *Medical.* Washington, July 12-13. Sec., Commission on Licensure, Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: Jacksonville, June 14-15. Sec., Dr. William M. Rowlett, Box 786, Tampa.

HAWAII: Honolulu, July 12-15. Sec., Dr. James A. Morgan, 48 Alexander Young Bldg., Honolulu.

ILLINOIS: Chicago, June 22-25 and Oct. 19-21. Superintendent of Registration, Department of Registration and Education, Mr. Homer J. Byrd, Springfield.

INDIANA: Indianapolis, June 22-24. Sec., Board of Medical Registration and Examination, Dr. William R. Davidson, 301 State House, Indianapolis.

IOWA: Iowa City, June 8-10. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

KANSAS: Topeka, June 15-16. Sec., Board of Medical Registration and Examination, Dr. C. H. Ewing, 609 Broadway, Larned.

KENTUCKY: Louisville, June 9-11. Sec., State Board of Health, Dr. A. T. McCormack, 532 W. Main St., Louisville.

MARYLAND: *Medical (Regular).* Baltimore, June 15-18. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Medical (Homeopathic).* Baltimore, June 8-9. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MICHIGAN: Ann Arbor and Detroit, June 9-11. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 202-204 Hollister Bldg., Lansing.

MINNESOTA: Minneapolis, April 20-22. Sec., Dr. Julian F. DuBois, 350 St. Peter St., St. Paul.

MISSISSIPPI: Jackson, June. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MISSOURI: St. Louis, June 14-16. State Health Commissioner, Dr. H. F. Parker, State Capitol Bldg., Jefferson City.

NEBRASKA: *Basic Science.* Omaha, May 4-5. *Medical.* Omaha, June 8-9. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NEVADA: Carson City, May 3-4. Sec., Dr. John E. Worden, Box 630, Carson City.

NEW JERSEY: Trenton, June 15-16. Sec., Dr. James J. McGuire, 28 W. State St., Trenton.

NEW YORK: Albany, Buffalo, New York and Syracuse, June 28-July 1. Chief, Professional Examinations Bureau, Mr. Herbert J. Hamilton, 315 Education Bldg., Albany.

NORTH CAROLINA: Raleigh, June 21. Sec., Dr. Ben J. Lawrence, 503 Professional Bldg., Raleigh.

NORTH DAKOTA: Grand Forks, July 6-9. Sec., Dr. G. M. Williamson, 4½ S. 3rd St., Grand Forks.

OKLAHOMA: Oklahoma City, June 9-10. Sec., Dr. James D. Osborn Jr., Frederick.

OREGON: *Medical.* Portland, June 15-17. Sec., Dr. Joseph F. Wood, 509 Selling Bldg., Portland. *Basic Science.* Corvallis, July 17. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

PENNSYLVANIA: Philadelphia and Pittsburgh, July 6-10. Sec., Board of Medical Education and Licensure, Dr. James A. Newpher, Education Bldg., Harrisburg.

SOUTH CAROLINA: Columbia, June 22. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: Rapid City, July 20-21. Dir., Division of Medical Licensure, Dr. B. A. Dyar, State Board of Health, Pierre.

VERMONT: Burlington, June 16-18. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, June 17-19. Sec., Dr. J. W. Preston, 28½ Franklin Road, Roanoke.

WISCONSIN: Milwaukee, June 29-July 2. Sec., Dr. Henry J. Gramling, 2203 S. Layton Blvd., Milwaukee.

WYOMING: Cheyenne, June 7. Sec., Dr. G. M. Anderson, Capitol Bldg., Cheyenne.

NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the *National Board of Medical Examiners and Special Boards* were published in THE JOURNAL, April 10, page 1291.

Montana October Report

Dr. S. A. Cooney, secretary, Montana State Board of Medical Examiners, reports the written examination held at Helena, Oct. 6-7, 1936. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Ten candidates were examined, all of whom passed. Sixteen physicians were licensed by reciprocity and 2 physicians were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Northwestern University Medical School		(1934)	83.2, 88.5, (1935) 83.7, (1936) 84.4
Johns Hopkins University School of Medicine		(1935)	84.8
University of Minnesota Medical School		(1933) 80.3, (1935)	81.5
Creighton University School of Medicine		(1931)	79.5
Syracuse University College of Medicine		(1908)	81.7
Jefferson Medical College of Philadelphia		(1936)	82.5

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College of Medical Evangelists		(1931)	California
Northwestern University Medical School		(1909)	Utah
Rush Medical College		(1915) N. Dakota, (1927)	California
Keokuk Medical College, College of Physicians and Surgeons, Iowa		(1901)	Iowa
University of Michigan Medical School		(1931)	Michigan
Wayne University College of Medicine		(1936)	Michigan
University of Minnesota Medical School		(1928), (1929), (1930)	Minnesota
St. Louis University School of Medicine		(1934)	Missouri
Creighton University School of Medicine		(1933) (1935)	N. Dakota, California
University of Pennsylvania School of Medicine		(1929)	Minnesota
Milwaukee Medical College		(1911)	Wisconsin
Universität Köln Medizinische Fakultät		(1920)*	Nebraska

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical Evangelists		(1936)	N. B. M. Ex.
Johns Hopkins University School of Medicine		(1931)	N. B. M. Ex.

* Verification of graduation in process.

Hawaii October Examination

Dr. James A. Morgan, secretary, Board of Medical Examiners, reports the oral and written examination held in Honolulu, Oct. 12-15, 1936. The examination covered 10 subjects and included 80 questions. An average of 75 per cent was required to pass. Six candidates were examined, 2 of whom passed and 4 failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Illinois College of Medicine		(1934)	85
Hahnemann Medical Col. and Hospital of Philadelphia		(1918)	82

School	FAILED	Year Grad.	Per Cent
Loyola University School of Medicine		(1930) (1936)	75,* 75*
Washington University School of Medicine		(1931)	76*
Licentiate of the Royal College of Physicians of London and Member of the Royal College of Surgeons of England		(1936)	72†

Three physicians were licensed by endorsement from July 31 through August 18 after an oral examination. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Tufts College Medical School		(1935)	N. B. M. Ex.
University of Minnesota Medical School		(1935)	N. B. M. Ex.
Columbia Univ. College of Physicians and Surgeons		(1935)	N. B. M. Ex.

* Failed in three or more subjects.
† Verification of graduation in process.

Oklahoma Reciprocity and Endorsement Report

Dr. James D. Osborn Jr., secretary, Oklahoma State Board of Medical Examiners, reports 20 physicians licensed by reciprocity and one physician licensed by endorsement at the meeting held in Oklahoma City, December 9, 1936. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine		(1935)	Arkansas
College of Medical Evangelists		(1925)	California
Denver and Gross College of Medicine		(1905)	Wyoming
University of Colorado School of Medicine		(1935)	Colorado
Emory University School of Medicine		(1935)	Georgia
Northwestern University Medical School		(1934)	Illinois
State University of Iowa College of Medicine		(1927), (1930), (1931)	Iowa
University of Kansas School of Medicine		(1935, 2)	Kansas
Tulane University of Louisiana School of Medicine		(1935)	Louisiana
Johns Hopkins University School of Medicine		(1930)	Maryland
Harvard University Medical School		(1929)	Maine
Washington University School of Medicine		(1912), (1933)	Missouri
University of Nebraska College of Medicine		(1934)	Nebraska
University of Buffalo School of Medicine		(1918)	New York
Vanderbilt University School of Medicine		(1924)	Tennessee
Baylor University College of Medicine		(1935)	Texas

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Washington University School of Medicine		(1929)	N. B. M. Ex.

Book Notices

Practical Examination of Personality and Behavior Disorders, Adults and Children. By Kenneth E. Appel, M.D., Ph.D., Sc.D., Assistant Professor of Psychiatry, Medical School, University of Pennsylvania, and Edward A. Strecker, M.D., A.M., Sc.D., Professor of Psychiatry, Medical School, University of Pennsylvania. Cloth. Price, $2. Pp. 219. New York: Macmillan Company, 1936.

This volume is an outline of examination methods to be used by psychiatrists, particularly by those in training. Parts have apparently been used in training students. It is made up of two parts, the first dealing with the adult, the second with the examination of the child. In the adult section one finds a conglomeration of examination methods consisting of outlines of what to look for on mental examination and on personality study. There are presented several approaches to the same problem, such as the questions asked on mental examination, outline of information to be obtained, and examination of stuporous patients. Three types of chapters are found in this part: one, how to examine in general, consisting of essays which present quite generalized technics; a second, giving outlines directed toward showing what specific items to look for, and a third type showing reporting forms for summarizing observations. The second part treats of child guidance examination technics, two types of information being made available: first, outlines are presented for the results of teachers', parents' and the psychiatrist's examinations in the case; the second variety of information consists of short chapters devoted to questions concerning lying, temper tantrums and other symptoms of maladjustment, which apparently are intended as suggestions in the matter of questioning a parent of the problem child. In the middle of this group of chapters is one on enuresis in which the condition is outlined. The chapter is not like the others in style or purpose. One must agree with the authors that there is at the present time no effective outline showing a student how to conduct a psychiatric examination, but there is a good reason for this state of affairs. Psychiatry depends on individual adjustments. The technic of one leader in the field often turns out a number of disciples who use the same technic but with signally less success. Usually the adequate student develops, under personal guidance, a useful method. Then he needs no outline. Before that a written guide is misleading in that it gives him a false assurance and stereotypes him. The general instructions given in the present volume on how to interview prove that the written word is no more helpful in making a psychiatrist than a book on how to succeed might be in making a millionaire. There is at the present time only one road to become a psychiatrist and to learn psychiatry, even for the dilettante physician, and that is by watching competent psychiatrists at work and examining patients oneself under the direction and guidance of experienced mental experts. Some of the summaries in the present volume are lists of words, without background. They mean nothing and may be pernicious. There is no point to the last chapter, entitled Psychiatric Terminology, for it is a mere list of words where a real glossary might have meant something. The uneven style, the short chapters containing little, and the universal outlines suggest that the authors met one day in their office and decided to write a book, which they did by culling various outlines from their files without too much revision. They have forgotten the fact that psychiatry is the one medical specialty that is on trial before the profession and the public, and an influx of incompetent amateurs might cause a major setback in its development.

Atlas der Gastrophotographie. Von M. J. Heilpern, O. Porges und H. Hofmann. Paper. Price, 10 marks. Pp. 29, with 45 illustrations. Leipzig & Vienna: Franz Deuticke, 1936.

Heilpern and Porges inaugurated modern gastrophotography in 1929. Two years later two French books appeared on this subject, the authors of whom used Heilpern's apparatus and technic. The inaugurators of the method are now publishing the first German book. Every one who has expected to find decisive progress in this field will be deeply disappointed. The method seems to have reached a deadline. However, in the preface in the first time during the history of gastrophotography a fair comparison of gastroscopy is given. "Gastroscopy has been improved by the construction of the flexible tube and now can be considered a safe method, which is easily learned. Definite areas of the stomach can be obtained more easily by the gastroscope than by the gastrophotograph. Gastroscopy has the advantage of showing the colors: this facilitates the diagnosis. However, gastrophotography still has the advantage of giving documents instead of short, gastroscopic, subjective impressions; furthermore, the local anesthesia is avoided and the gastrophotograph lies for a much shorter period in the stomach than does the gastroscope." The two latter advantages are imaginary, but the first, the possibility to present the gastric mucosa on objective documents, would be of importance if such objective documents were available. But apparently they are not. Perhaps it would not be fair to compare the numerous pictures of this book with the brilliant pictures as seen through a gastroscope. However, the comparison of these photographs with the photographs obtained through the old rigid gastroscopes (which also were unsatisfactory) shows that "blind" gastrophotography is of no avail. Only figures 23, 35, 37 and 57b correspond somewhat with certain gastroscopic pictures. A definite diagnosis would be impossible even in these cases. The pylorus never can be photographed. If one considers all the books and papers that have appeared since the invention of gastrophotographic apparatus, one can but regret the tremendous efforts of so many excellent workers, which have had such poor final results.

Mrs. Eddy Purloins from Hegel: Newly Discovered Source Reveals Amazing Plagiarisms in Science and Health. By Walter M. Haushalter. Cloth. Price, $1.50. Pp. 126, with 2 illustrations. Boston: A. A. Beauchamp, 1936.

Mark Twain in 1907 challenged Mary Baker Eddy's authorship of Science and Health. The greatest humorist surmised that the source of much of Science and Health was some unknown author who died before his work gained public attention. Other students also have questioned Mrs. Eddy's authorship of Science and Health. The purpose of this small book by Walter M. Haushalter is to show that these skeptics were correct, as well as to show the source from which Mrs. Eddy "purloined" much of her famous book. In the long search for the possible original source of Science and Health conducted in the leading American libraries from coast to coast, every idealistic writing antedating 1870 was inspected. One day in Stoughton, Mass., some one recalled that a Mr. Minot Crane, formerly associated with Hiram Crafts, was a partner of Mrs. Eddy in an office for the practice of healing by mental means. This partnership, however, was short lived, as dissension arose. Mr. Crane lived across the street from Hiram Crafts. He was for thirty years an elder in the Baptist church and was regarded as one of the leading citizens of his community. Mrs. Eddy had lived in the Crafts home in the city of Avon and during that period Crane was a confidant of Hiram Crafts. After several conversations with Mr. Crane, he disclosed that he possessed a carefully wrapped parcel which Mr. Crafts had given him in the early eighties when he departed from Avon and Stoughton. Crafts also divulged the significance of the package and its intimate relation to Mary Baker Eddy's book Science and Health, hoping that some day the facts would be made public. The contents of this package were found to comprise a letter written to Hiram Crafts by Francis Lieber and also a beautifully written document of twelve pages entitled "The Metaphysical Religion of Hegel," also written by Dr. Lieber. Crane consented to dispose of this document and letter, which are reproduced in the book under review. The author places side by side for comparison numerous parts of Dr. Lieber's document and parts of Science and Health to show that the foundation of that philosophy, if such it may be called, was "purloined" from Lieber's philosophical treatise of hegelian metaphysics. Hegel, the author says, was the flower of German metaphysics, whose works, comprising eighteen large volumes, were published just after his death in 1832. The present author reviews the philosophy of Hegel briefly. Francis Lieber, author of the now famous source document, likewise was born in Germany. He received the degree of doctor of philosophy at the University of Jena in 1820 and came to Boston in 1827, where he worked on the Encyclopedia Americana and published a translation of a French work on the revolution. He moved to New York in 1832, where he was commissioned to prepare a plan of education and instruction for Girard College, which took him to Phila-

delphia. Then he became professor of history and political economics in South Carolina College, remaining in Columbia, S. C., for more than twenty years. In 1857 he was elected to a similar professorship in Columbia College, New York, and later to the chair of political science in the law school, where he remained until his death in 1872. Lieber was a member of the Kantian Society. The Source Document bears the memorandum "Copied for Hiram Crafts, to be read before the Kantian Group, Boston Lyceum, 1866." Science and Health was published in 1875, eight years after Mrs. Eddy's stay in the Crafts home and three years after Dr. Lieber's death. In comparing these two documents the author points out that on page 85 of Dr. Lieber's document he said "Hegel's science brings to light truth and its supremacy," which statement Mrs. Eddy is said to have changed on page 293 of Science and Health to "Christian Science brings to light truth and its supremacy." A similar substitution appears in the following quotation from Lieber's document: "That spirit propagates matter or matter spirit, is morally impossible. Hegel repudiates the thought" (p. 86). Mrs. Eddy changes, the author says, these sentences to read as follows: "That spirit propagates matter or matter spirit, is morally impossible. Hegel repudiates the thought." (This is on page 264 of Science and Health.) There are many other comparisons of the two documents made here.

The addenda to this book was entitled "Mrs. Eddy's Later Plagiarisms," meaning those instances which occurred from 1895 to 1905. It is said that she took also from Carlyle, Ruskin, Amiel, Hugh Blair and Quimby. The following quotation from Mrs. Eddy's Science and Health appears on page 1 of Haushalter's book:

> "No human pen nor tongue taught me the Science contained in this book, Science and Health. . . . I have found nothing in ancient or in modern systems on which to found my own, except the teachings and demonstrations of our great Master and the lives of prophets and apostles. The Bible has been my only authority. I have had no other guide in 'the straight and narrow way' of Truth." (Science and Health, pp. 110, 126.)

The Christian Science Board of Directors, disbelieving the authenticity of this book, submitted specimens of Mrs. Eddy's handwriting and specimens of Francis Lieber's handwriting to some handwriting experts, who said that neither the letter in question nor the manuscript in question nor the purported signatures were in the handwriting of Francis Lieber, and that neither the notation in question nor the purported signature of Mary Baker was in the handwriting of Mary Baker Eddy.

Trudy Instituta Mozga. Vypusk II. Pod redaktsiey S. A. Sarkisova i I. N. Filimonova. Les travaux de l'Institut du Cerveau. Volume II. Cloth. Price, 18 rubles 75 kopecks. Pp. 278, with 21 illustrations and atlas containing 27 microphotographic plates. Moscow: Izdanie Gosudarstvennogo Instituta Mozga, 1936.

This volume, emanating from the Brain Institute in Moscow, presents four papers. In "Ontogenesis of the Isocortex in Man," G. I. Poliakov describes the anatomy of the isocortical part of the lamina corticalis in a human embryo whose crown-coccyx length was 90 mm. In a paper entitled "Variability of the Structure of the Cerebral Cortex of the Temporal-Basal Region of the Adult," P. S. Blinkov presents an anatomic study of ten human cerebral hemispheres. J. Shevchenko presents a paper on "The Variability of the Cerebral Cortex in Higher Anthropoids," and A. S. Chernyshev on the anatomy of "The Superior Limbic Region in Monkeys." A separate atlas consisting of eighty photomicrographs, illustrating the work of the authors, accompanies the text.

The Principles of Dental Medicine: The Medical Aspects of Dental Disease. By F. W. Broderick, M.R.C.S., L.R.C.P., L.D.S., Hon. Dental Physician to the Royal Victoria and West Hants Hospital, Bournemouth. Second edition. Cloth. Price, $7.50. Pp. 575, with 27 illustrations. St. Louis: C. V. Mosby Company, 1936.

The author discusses the effect of the development of specialization on the practice of medicine and emphasizes the fact that the medical profession and to a still greater extent the dental profession have devoted most of their energy to the repair of the damage produced by disease rather than to the cure or prevention of disease. He follows the development of ideas in the history of medicine and points out how this development has contributed to the present condition. He discusses diathesis and emphasizes the well known clinical observation that teeth are lost either by caries or by pyorrhea and that in general the patient with caries does not have pyorrhea and the patient with pyorrhea does not suffer with decay of the teeth; he indicates that each of these two dental conditions is associated with different types of disease in the other organs and tissues of the body. The book is stimulating and challenges thought. Although there may be some differences of opinion concerning details, such as the author's view on the vitality of the dental enamel, it is indeed encouraging to find one who is willing to review and reassay fundamental concepts in terms of the newer developments of knowledge. Broderick makes it clear that dentistry cannot be separated from the whole of medicine and that in the study of the initial deviations from normal which lead to disease there are early indications that are of great advantage to the dentist in the study of pathology. The book should have the attention of both physicians and dentists; it is certain to arouse differences of opinion that will provoke thought and discussion.

Die Nebennierenrinde: Beiträge zur experimentellen und klinischen Pathologie. Von Dr. med. Sigismund Thaddea, Assistent der II. Med. Universitätsklinik der Charité, Berlin. Paper. Price, 11 marks. Pp. 199, with 114 illustrations. Leipzig: Georg Thieme, 1936.

The author presents a superficial review of much of the literature on the adrenal cortex and includes some recent experimental and clinical studies made in Berlin. This work is largely repetition or confirmation of original studies conducted and published elsewhere. The author's own contributions in this field are represented by eight papers (chiefly clinical) published in 1935 and 1936. The limited portion of the book concerned with clinical use of adrenal cortex extract includes treatment of conditions that are by no means proved to be associated with disturbed function of the adrenal cortex. Concerning adrenal cortex extracts, mention is made of four German proprietary products with special preference for a particular one of these, available in liquid form for parenteral administration and in tablets for oral use. As is the case with all other commercial preparations of the adrenal cortex, there is no proof that this particular product can substitute for functional loss of the cortical hormone. Especially is this true of tablets for oral administration. Yet page after page in the book is devoted to experimental and clinical observations in which the use of this particular commercial product is represented as supplying the adrenal cortex "hormone." Indeed, so striking is the frequent reference to this proprietary product that perusal of the monograph leaves an impression much like that gained from reading the publications distributed to physicians by some commercial pharmaceutic firms.

Modern Urology in Original Contributions by American Authors. Edited by Hugh Cabot, M.D., LL.D., C.M.G., Professor of Surgery, The Mayo Foundation. Volume I: General Considerations—Diseases of Penis and Urethra—Diseases of Scrotum and Testicle—Diseases of Prostate and Seminal Vesicles. Volume II: Diseases of the Bladder—Diseases of the Ureter—Diseases of the Kidney—Radiation Therapy of Tumors of the Genito-Urinary Tract. Third edition. Cloth. Price, $20, per set. Pp. 951, with 558 illustrations; 862, with 383 illustrations. Philadelphia: Lea & Febiger, 1936.

The first edition of this book appeared about twenty years ago at a time when urology in America was a young specialty. Within the twelve years since the second edition was published, many advances have been made in the practice of urology, necessitating now the rewriting of many of the articles. The present edition has been so thoroughly revised as to constitute almost a new work. Many of the thirty-five contributors to the present two volumes are also new as such, even though they are widely known within the profession. They were selected, it is said, in order to present the widest possible representation of urologic opinion in America. They include leading diagnosticians, therapists, surgeons and pathologists in the field of urology. Emphasis is placed throughout on diagnosis and treatment. The two volumes are profusely and unusually well illustrated, mostly by original illustrations. Volume I opens with a chapter on the history of the cystoscope. Bozzani constructed in 1805 his "licht liter," with which he was able for the first time to visualize the human urethra in the living subject. This bold inventor was accused of showing an undue curiosity in investigating the concealed regions of the human body, and the medical faculty of Vienna was charged by the Austrian government to investigate his radical instrument. Twenty years later a second attempt was made to look into the urinary tract by

Segalas, who called his instrument the "speculum urethrocystique." At about the same time Dr. John D. Fisher of Boston described an instrument originally constructed to inspect the vagina but later modified so it could be used to inspect the urethra. Twenty years passed again before there was any advance in instruments of this kind; then in 1853 Desormeaux brought forth an endoscope in which rays of light were reflected down the tube by means of mirrors, the source of which was a kerosene lamp. So this interesting history of the cystoscope goes on to the present day. Chapters on the anatomy of the genito-urinary organs follow; also on tumors of these organs, on gonorrhea, syphilis, lymphogranuloma inguinale, calculi and renal infections, including a large chapter on tuberculosis of the kidney and ureters, cystitis and other diseases. The treatment of all these conditions is adequately discussed, and those which are amenable to surgical operations especially are beautifully illustrated in detail, including a few illustrations in color. An index closes each volume. In its present form Cabot's Modern Urology is thoroughly modern and is comprehensive and authoritative.

Occupation and Health: Encyclopaedia of Hygiene, Pathology and Social Welfare. Volume I: A-H; Volume II: I-Z. International Labour Office. Cloth. Price, $24, per set. Pp. 999, with 181 illustrations; 1,310, with 207 illustrations. Boston: World Peace Foundation; Geneva, 1930, 1934.

The increasing interest in industrial disease and in the problems in health arising from industry make especially valuable the preparation of this encyclopedia. In its development, competent industrial physicians and surgeons from all over the world have participated. The subjects concerned are classified under the headings of the work itself, the worker and the environment. Toxic substances like acetone, for example, are discussed under headings which indicate the nature of the substance, its method of preparation, its uses, the means for detecting its presence, legislation affecting the substance and the bibliographic references. Under more widely used substances, as, for example, acetylene, there are also references concerning statistics, diagnosis, symptoms and hygiene. There are extensive articles on accidents in industry, resuscitation devices, canning and food preserving, effects of industry on children and young people, and many similar topics. Particularly interesting is a discussion of industrial diseases associated with hair cutting and the work of furriers. Numerous illustrations show how industrial processes vary throughout the world. Every worker in industry and every journalist and library concerned with the effects of industrial disease will find these volumes invaluable.

Remington's Practice of Pharmacy: A Treatise on the Making, Standardizing, and Dispensing, of Official, Unofficial, and Extemporaneous Pharmaceutical Preparations, with Descriptions of Medicinal Substances, Their Properties, Uses, and Doses, and Such Other Professional Service in Connection with Community Health as the Pharmacist may be Called Upon to Render. Intended for the Use of Pharmacists and Physicians and as a Textbook for Students. By E. Fullerton Cook, P.D., Ph.M., Chairman of the Committee of Revision of the Pharmacopœia of the United States of America, Charles H. LaWall, Ph.M., Pharm.D., Sc.D., Dean of Pharmacy, Philadelphia College of Pharmacy and Science, and others. Eighth edition. Cloth. Price, $10. Pp. 2,162, with 702 illustrations. Philadelphia & London: J. B. Lippincott Company, 1936.

This textbook, previous editions of which have occupied important places in the pharmacists' libraries for several generations, has been revised to conform with the United States Pharmacopeia XI, the National Formulary VI, and New and Nonofficial Remedies 1936. The scope of the volume is broad, covering thoroughly pharmaceutical knowledge and practice. It is a monumental piece of work in its field. Therapeutic uses for the individual drugs and their preparations are given. Although the therapeutic discussions are not highly critical, they are more conservative than in most books of this type. The chemistry and therapeutic use of glandular products have been revised and enlarged to conform with recent knowledge. This is a most reliable chapter. A new section on hospital pharmacy has been added, though the waning homeopathy is still represented. The book is complete with information on such topics as laws dealing with pharmacy, urinalysis, general description of the U. S. Pharmacopeia and the National Formulary, sterilization and ampules, methods of making pills and tablets, and even such topics as ligatures and sutures. In this work Professors Cook and LaWall have the helpful aid of more than thirty collaborators. The book also contains many illustrations; typographic errors are quite occasional. The volume is a contribution that rightly retains its place among the best in textbooks on pharmacy. It will serve well the physician who wishes to augment his library with a representative pharmaceutical work.

Medizinische Praxis: Sammlung für ärztliche Fortbildung. Herausgegeben von Prof. Dr. L. R. Grote, leitender Arzt der medizinischen Klinik des Rudolf-Hess-Krankenhauses Dresden, Prof. Dr. A. Fromme, Direktor der chirurgischen Abteilung des Stadtkrankenhauses Dresden-Friedrichstadt, und Prof. Dr. K. Warnekros, Direktor der staatlichen Frauenklinik zu Dresden. Band XIV: Elektrokardiographie für die ärztliche Praxis. 15 Vorlesungen zur Einführung in die elektrische Untersuchungsmethode des Herzens und ihre praktischen Ergebnisse bei rhythmischem und arrhythmischem Herzschlag. Von Prof. Dr. Erich Boden. Third edition. Paper. Price, 10 marks. Pp. 187, with 104 illustrations. Dresden & Leipzig: Theodor Steinkopff, 1936.

This edition has been increased in size by some thirty pages and is much better assembled than the preceding edition. However, in comparison with other books both in German and in English dealing with the subject, this one is somewhat inferior. Not much is said about the precordial lead in infarction of the heart. The terminology with regard to ventricular extrasystoles and bundle branch block used by the author is no longer followed. Many of the electrocardiograms are touched up, and the illustrations presented to cover the various subdivisions might have been improved. Nevertheless, the diagrams with which this booklet is profusely illustrated should be stimulating not only to beginning students and medical practitioners but also to persons well versed in the subject.

Pathology. By Eugene C. Piette, M.D., Pathologist and Director of the Clinical Laboratories of the West Suburban Hospital, Oak Park, Illinois. Second edition. Fabrikoid. Price, $1.75. Pp. 263, with 60 illustrations. Philadelphia: F. A. Davis Company, 1936.

This little book was written to provide training for nurses in a few elementary principles of pathology. The author has attempted to present briefly a few of the most important problems. The list of questions at the end of each chapter helps to facilitate comprehension. Considerable emphasis is placed on the handling of specimens for laboratory work. The book evidences a sincere attempt to introduce the subject of pathology to nurses in training in as simple a manner as the short time at their disposal permits. It should fill its purpose admirably.

Plastic Surgery of the Nose. By J. Eastman Sheehan. Second edition. Cloth. Price, $9. Pp. 186, with 235 illustrations. New York & London: Paul B. Hoeber, Inc., 1936.

This edition is more compact, more graphic and more practical than the first. The deformities are better classified and their correction described as problems of everyday practice. The author recognizes the fact that nasal deformities usually involve more than one aspect of the nose and that it is necessary to combine several procedures in order to regain the normal. His chapter on typical and distinctive operations therefore in the first part of the book leads the way to a better understanding of the classified corrections that are taken up in the succeeding chapters. Several of the author's procedures differ somewhat from the Joseph technic, which most rhinoplastic surgeons have adopted, but all of them are based on sound surgical principles. The rationale of his technic is clearly explained and numerous illustrations bring home forcibly the important details. His description of the costal cartilage implant for saddle nose is still preeminent. The book is neither too long nor too involved, which should recommend it to surgeons in general as well as to rhinologists and oral surgeons.

Veröffentlichungen aus der Konstitutions- und Wehrpathologie. Herausgegeben von L. Aschoff, W. Ceelen, W. Koch und P. Schürmann. Geleitet von W. Koch. Heft 38. Band IX, Heft 1: Renaler Zwergwuchs. Von Alfred Welz. Paper. Price, 51 marks. Pp. 56, with 13 illustrations. Jena: Gustav Fischer, 1936.

This monograph on renal dwarfism develops the subject from the standpoint of previous cases described in the literature with especial emphasis on the clinical picture, the pathologic anatomy and the pathologic physiology. Two cases studied by the author are carefully described. Eighty-six references are given. The author goes into great detail with regard to the relationship of the bone changes of so-called renal rickets. He also

discusses the significance of blood chemistry with particular emphasis on the changed calcium: phosphorus ratio. He concludes that the dwarfism is due in all probability to the development of growth-restraining substances arising in the body because of the increasing acidosis and toxicosis resulting from so-called chronic interstitial nephritis. He suggests the possibility that in this process certain hormones are destroyed.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Medical Practice Acts: Right of Examining Board to Redetermine Qualifications of Applicant.—William V. Dubin in 1925 was refused permission to take the examination for a license to practice medicine in Wisconsin because he lacked the statutory qualifications. The following year he again applied for an examination, presenting to the board a diploma from the Maximilian University of Würzburg, Germany, but, because the foreign credentials were neither translated nor verified, an examination was refused. In 1928 and 1929 Dubin's applications for permission to take the examination were denied, the board having had notice that the foreign diploma had been revoked. In June 1930 Dubin presented a statement from the American consulate certifying that the revocation of the diploma had been rescinded and Dubin was permitted to take the examination. He failed. Subsequently he was examined on six other occasions and failed each time. Following the last attempt, in 1934, the board permitted Dubin to take a special examination in one subject after he had signed an agreement that the board would not grade the examination paper until it had further satisfied itself concerning his qualifications. The agreement specified that the board would make its determination "by the time or at the time of the regular meeting of said board in January, 1935." At that meeting the board passed a resolution refusing to grade the examination paper and to issue a license for the reason that "said Dubin has not completed the required medical studies to entitle him to practice medicine and surgery, or to graduate from a reputable medical college, and is not intellectually, morally or professionally qualified to practice medicine and surgery in the state of Wisconsin." Thereafter Dubin sought a writ of mandamus to compel the board of medical examiners to grade his paper and to issue to him a license to practice in Wisconsin. The trial court denied the petition and Dubin appealed to the Supreme Court of Wisconsin.

Dubin first contended that the agreement exacted from him as a condition to his taking the special examination was discriminatory and beyond the power of the board. The wisdom of this administrative procedure, said the court, may well be questioned, but it could hardly be condemned on either of the grounds assigned. Since Dubin was not entitled under the rules of the board to a special examination, the granting of it was a concession to him, and if there was discrimination, it was in his favor, and there was no reason, the court said, why the board might not condition this concession on a recanvass of the facts bearing on Dubin's qualifications. The medical practice act provided that the board must find Dubin qualified before it could issue a license to him. The term "qualified" has reference to the moral, professional, educational and intellectual qualifications of the applicant, and the board, even after accepting as prima facie satisfactory a showing by an applicant on any of these matters, may reinvestigate and come to a different conclusion provided the ultimate judgment is not arbitrary or capricious.

The ultimate question in the case, said the court, was whether the action of the board was arbitrary and capricious. The record showed that Dubin attended Marquette University School of Medicine during the school year 1918-1919, and that because of his poor scholastic record he was advised to repeat the work of the first year. During the summer sessions of 1919 and 1920 he earned some credits in the University of Wisconsin Medical School and was permitted in the fall of 1920 to reenter Marquette and take second year work on probation. He was dismissed from that university in February 1921 for dishonesty in examination and received no credit for the work done during the fall. Dubin claimed to have matriculated in Hahnemann Medical College in September 1921 as a third year student, but the evidence showed that he was admitted as a special student taking freshman work and that in October 1922 he was declined the privilege of further registration because of poor scholarship. He then matriculated at the St. Louis College of Physicians and Surgeons, "a class C school and rated a diploma mill by the board." Although he claimed to have graduated from that school, a supposedly complete list of graduates of the year of his claimed graduation did not include his name. While Dubin claimed to have entered the University of Freiburg in Germany some time in February 1925 and to have pursued there all the necessary medical courses, advices from that school indicated that he entered the summer session of 1925 and merely took some relatively unimportant laboratory courses. Although Dubin claimed to have pursued medical studies at Maximilian University at Würzburg, he never matriculated there. By special dispensation he was permitted to present a doctor's thesis and take an examination at the school and was apparently granted a degree. Thus, observed the court, the school which gave the degree had had no supervision over the medical training of Dubin and gave the degree because of his preliminary work at other schools. This degree was later revoked by the Maximilian University because it had been "ascertained that the candidate does not possess the necessary preliminary education and that the conferring of the degree is based on incorrect statements and presuppositions." In 1930, after representations made to the ministry of state through the office of the American consul, the action revoking the degree was rescinded "because there was no guilt on Dubin's part." It will be noted, said the court, that the action rescinding the revocation of the degree made no finding that the original action of revocation was founded on mistake. A refusal to grant a license on the foregoing facts cannot, said the court, be the basis for a claim of arbitrary conduct by the board.

Dubin next contended that he had no hearing or opportunity to be heard when the board finally acted on his case. This contention, said the court, was without merit. The action was taken by the board at a regular meeting. The time of such meeting was regulated by statute. Whatever materiality the agreement signed by Dubin might have, it was clear that it notified him that action on his preliminary training and general qualifications would be taken at the regular meeting of the board in January 1935. This was a sufficient notice, and Dubin could have appeared and presented to such meeting any matters germane to the inquiry.

The Supreme Court concluded, therefore, that the trial court correctly held that Dubin was not entitled to a writ of mandamus.—*State ex rel. Dubin v. Wisconsin State Board of Medical Examiners (Wis.), 268 N. W. 116.*

Pharmacy Practice Acts: Sale of Aspirin (Acetylsalicylic Acid) by Grocer.—The pharmacy practice act of Montana declares it to be unlawful, with certain exceptions not here pertinent, for any person other than a registered pharmacist to sell at retail any drug other than a "patent" or proprietary medicine in the original package. The defendant, a retail grocer, was convicted of violating this act under a complaint charging him with selling an original package of aspirin. He thereupon appealed to the Supreme Court of Montana.

It was testified at the trial, said the court, that aspirin is a drug and it was shown that aspirin is usually held not to be a proprietary or "patent" medicine within the meaning of acts similar to the one here involved. The question before the court was the constitutionality of the limitation to pharmacists of the sale of drugs in manufacturer's original packages. All decisions agree, said the court, on the validity of statutes licensing pharmacists and prohibiting the sale by persons other than licensed pharmacists of drugs and medicines which are compounded by the vender or sold by him in any manner other than in the original package of the manufacturer. A diversity of opinion arises, however, concerning the constitutionality of

acts with reference to medicine and drugs sold in the original package of the manufacturer. The arguments advanced to sustain the constitutionality of such acts did not appeal to the Supreme Court of Montana. On the other hand, the court quoted extensively, with apparent approval, from *State* v. *Wood*, 51 S. D. 485, 215 N. W. 487, decided by the Supreme Court of South Dakota and involving the sale of a proprietary medicine. Said that court, in part:

> Both the briefs of appellant and of the amicus curiae seem to assume that restricting the sale of such medicines to registered pharmacists will protect the public from all the ills that might result from unrestricted sale. But they do not point out how the public are protected. It is suggested that a pharmacist, to obtain his license, must be of good moral character, and that would protect the public from verbal misbranding, fraud, and dangerous medicines; but why restrict the sale to pharmacists only, when there are many other men of good moral character? If moral character is a sufficient guaranty, the statute might require vendors to be men of good moral character; but there can be no reason for requiring them to be druggists. Again, it is urged that pharmacy is a profession with a code of ethics; but pharmacy is not the only profession with a code of ethics. It is argued that pharmacists have knowledge of the effect of medicines they sell; this is no doubt some protection against accidental injury resulting from ignorance, but it is not plain that pharmacists do know the ingredients of patent and proprietary medicines, or that they are required to use or possess any knowledge in making a sale of such medicines. If one has a doctor's prescription filled at a drug store, he buys not the medicine alone, but the druggist's knowledge and skill in dispensing it; but if he were to buy Watkins' Pain-Oleum at the drug store, what more would he buy than if he bought elsewhere? . . . It does not seem that merely selling an article, though that article be medicine, can be classed as the practice of a learned profession. It would seem that the practice of a profession ought to call in use the learning peculiar to the profession. . . . It would seem to be an unreasonable exercise of the police power to limit sales to the profession, without requiring anything of the profession to safeguard the public health.

Taking into consideration, said the Supreme Court of Montana, that the pharmacy practice act absolves pharmacists from all responsibility as to the purity, strength and quality of drugs or medicines which are sold in the manufacturer's original packages, no justifiable reason exists for arriving at the conclusion that to limit the sale of such articles exclusively to pharmacists can in any way tend to protect or preserve the public health. The court therefore held the pharmacy practice act unconstitutional so far as it restricted to pharmacists the sale of drugs and medicines sold in the manufacturer's original packages. The judgment of the trial court was reversed and the cause remanded with direction to dismiss the complaint.—*State v. Stephens (Mont.), 59 P. (2d) 54.*

Malpractice: Radium Left in Patient; Accrual of Right of Action.—The defendant, a physician, inserted ten "radium beads" in the uterus of the plaintiff's wife, Jan. 18, 1929, for a condition diagnosed as cancerous. According to the record, one of these "beads" was supposed to be removed each succeeding day by means of a string attached to it. At the expiration of the ten-day period the defendant advised the plaintiff and his wife that all the "beads" had been removed. Despite this assurance, it was alleged, four "beads" were left in the uterus. They severely burned the plaintiff's wife, migrating to the intestine. Peritonitis set in about March 1, 1935, resulting in the death of the wife on March 18. The plaintiff thereupon sued the defendant for damages for the death of his wife. The trial court overruled a demurrer filed by the defendant to the petition and he appealed to the Supreme Court of Kansas.

The only question before the Supreme Court was whether or not the action was barred by the two-year statute of limitations. The defendant contended that the right of action accrued when, at the expiration of the ten-day period, he failed to remove the last "bead." The suit was barred by the statute of limitations, said the Supreme Court. If a plaintiff seeks to recover damages from a physician on account of alleged malpractice, the action sounds in tort and the two-year statute of limitations applies and is not tolled by concealment of the tort by the physician. The right of action accrues when the tort is committed. In an action based on wrongful death where the statute of limitations had run against an action by the injured party, an action by his personal representatives under the wrongful death statute is also barred. The judgment of the trial court overruling the defendant's demurrer was therefore reversed.—*Graham v. Updegraph (Kan.), 58 P. (2d) 475.*

Society Proceedings

COMING MEETINGS

American Medical Association, Atlantic City, N. J., June 7-11. Dr. Olin West, 535 North Dearborn St., Chicago, Secretary.

Alabama, Medical Association of the State of, Birmingham, April 20-22. Dr. D. L. Cannon, 519 Dexter Ave., Montgomery, Secretary.

American Academy of Pediatrics, New York, June 3-5. Dr. Clifford G. Grulee, 636 Church St., Evanston, Ill., Secretary.

American Academy of Tuberculosis Physicians, Atlantic City, N. J., June 7-8. Dr. Arnold Minnig, 638 Metropolitan Bldg., Denver, Secretary.

American Association for Thoracic Surgery, Saranac Lake, N. Y., May 31-June 2. Dr. Richard H. Meade Jr., 2116 Pine St., Philadelphia, Secretary.

American Association on Mental Deficiency, Atlantic City, N. J., May 5-8. Dr. E. Arthur Whitney, Elwyn, Pa., Secretary.

American Bronchoscopic Society, Atlantic City, N. J., June 2. Dr. Lyman Richards, 319 Longwood Ave., Boston, Secretary.

American College of Physicians, St. Louis, April 19-23. Mr. E. R. Loveland, 4200 Pine St., Philadelphia, Executive Secretary.

American Dermatological Association, Sky Top, Pa., June 3-5. Dr. Fred D. Weidman, 1930 Chestnut St., Philadelphia, Secretary.

American Gastro-Enterological Association, Atlantic City, N. J., June 7-8. Dr. Russell S. Boles, 1901 Walnut St., Philadelphia, Secretary.

American Gynecological Society, Swampscott, Mass., May 31-June 2. Dr. Richard W. TeLinde, 1201 N. Calvert St., Baltimore, Secretary.

American Laryngological Association, Atlantic City, N. J., May 31-June 2. Dr. James A. Babbitt, 1912 Spruce St., Philadelphia, Secretary.

American Laryngological, Rhinological and Otological Society, Atlantic City, N. J., June 3-5. Dr. C. Stewart Nash, 708 Medical Arts Bldg., Rochester, N. Y., Secretary.

American Neurological Association, Atlantic City, N. J., June 3-5. Dr. Henry A. Riley, 117 East 72d St., New York, Secretary.

American Ophthalmological Society, Hot Springs, Va., June 3-5. Dr. J. Milton Griscom, 255 South 17th St., Philadelphia, Secretary.

American Orthopedic Association, Lincoln-Omaha, Neb., June 2-4. Dr. Ralph K. Ghormley, 110 Second Ave. S.W., Rochester, Minn., Secretary.

American Otological Society, New York, May 27-28. Dr. Thomas J. Harris, 104 East 40th St., New York, Secretary.

American Pediatric Society, Hot Springs, Va., April 29-May 1. Dr. Hugh McCulloch, 325 North Euclid Ave., St. Louis, Secretary.

American Physiological Society, Memphis, Tenn., April 21-24. Dr. A. C. Ivy, 303 East Chicago Ave., Chicago, Secretary.

American Proctologic Society, Atlantic City, N. J., June 6-8. Dr. Curtice Rosser, 710 Medical Arts Bldg., Dallas, Texas, Secretary.

American Psychiatric Association, Pittsburgh, May 10-14. Dr. William C. Sandy, State Education Bldg., Harrisburg, Pa., Secretary.

American Society for Clinical Investigation, Atlantic City, N. J., May 3. Dr. J. M. Hayman Jr., 2065 Adelbert Road, Cleveland, Secretary.

American Society for Experimental Pathology, Memphis, Tenn., April 21-24. Dr. Shields Warren, 195 Pilgrim Road, Boston, Secretary.

American Society for Pharmacology and Experimental Therapeutics, Memphis, Tenn., April 21-24. Dr. E. M. K. Geiling, 947 East 58th St., Chicago, Secretary.

American Society of Biological Chemistry, Memphis, Tenn., April 21-24. Dr. H. A. Mattill, Chemistry Building, State University of Iowa, Iowa City, Secretary.

American Society of Clinical Pathologists, Philadelphia, June 2-6. Dr. A. S. Giordano, 531 North Main St., South Bend, Ind., Secretary.

American Surgical Association, New York, June 3-5. Dr. Charles G. Mixter, 319 Longwood Ave., Boston, Secretary.

American Therapeutic Society, Atlantic City, N. J., June 4-5. Dr. Oscar B. Hunter, 1835 Eye St. N.W., Washington, D. C., Secretary.

Associated Anesthetists of the United States and Canada, Atlantic City, N. J., June 7-8, Dr. F. H. McMechan, 318 Hotel Westlake, Rocky River, Ohio, Secretary-General.

Association for the Study of Internal Secretions, Atlantic City, N. J., June 7-8, Dr. E. Kost Shelton, 921 Westwood Blvd., Los Angeles, Secretary.

Association of American Physicians, Atlantic City, N. J., May 4-5. Dr. Hugh J. Morgan, Vanderbilt University Hospital, Nashville, Tenn., Secretary.

California Medical Association, Del Monte, May 2-5. Dr. F. C. Warnshuis, 450 Sutter St., San Francisco, Secretary.

Connecticut State Medical Society, Bridgeport, May 19-20. Dr. Creighton Barker, 258 Church St., New Haven, Secretary.

District of Columbia, Medical Society of the, Washington, May 5-6. Dr. C. B. Conklin, 1718 M St. N.W., Washington, Secretary.

Federation of American Societies for Experimental Biology, Memphis, Tenn., April 21-24. Dr. Shields Warren, 195 Pilgrim Road, Boston, Secretary.

Georgia, Medical Association of, Macon, May 11-14. Dr. Edgar D. Shanks, 478 Peachtree St. N.E., Atlanta, Secretary.

Hawaii Territorial Medical Association, Hilo, April 30-May 2. Dr. Douglas B. Bell, Queen's Hospital, Honolulu, Secretary.

Illinois State Medical Society, Peoria, May 18-20. Dr. Harold M. Camp, 202 Lahl Bldg., Monmouth, Secretary.

Iowa State Medical Society, Sioux City, May 12-14. Dr. Robert L. Parker, 3510 Sixth Avenue, Des Moines, Secretary.

Kansas Medical Society, Topeka, May 3-6. Mr. Clarence G. Munns, Stormont Bldg., Topeka, Executive Secretary.

Louisiana State Medical Society, Monroe, April 26-28. Dr. P. T. Talbot, 1430 Tulane Ave., New Orleans, Secretary.

Maryland, Medical and Chirurgical Faculty of, Baltimore, April 27-28. Dr. Walter Dent Wise, 1211 Cathedral St., Baltimore, Secretary.

Massachusetts Medical Society, Boston, June 1-3. Dr. Alexander S. Begg, 8 The Fenway, Boston, Secretary.

Medical Library Association, Richmond, Va., May 23-26. Miss Janet Doe, 2 East 103d St., New York, Secretary.

Medical Women's National Association, Atlantic City, N. J., June 6-8. Dr. F. S. Fetterman, 7047 Germantown Ave., Philadelphia, Secretary.

Minnesota State Medical Association, St. Paul, May 3-5. Dr. E. A. Meyerding, 11 West Summit Ave., St. Paul, Secretary.

Mississippi State Medical Association, Meridian, May 11-13. Dr. T. M. Dye, McWilliams Bldg., Clarksdale, Secretary.

Missouri State Medical Association, Cape Girardeau, May 10-12. Dr. E. J. Goodwin, 634 North Grand Blvd., St. Louis, Secretary.

National Tuberculosis Association, Milwaukee, May 31-June 3. Dr. Charles J. Hatfield, 7th and Lombard Sts., Philadelphia, Secretary.

Nebraska State Medical Association, Omaha, May 10-13. Dr. R. B. Adams, 15 N Street, Lincoln, Secretary.
New Hampshire Medical Society, Manchester, May 18-19. Dr. Carleton R. Metcalf, 5 South State St., Concord, Secretary.
New Jersey, Medical Society of, Atlantic City, April 27-29. Dr. J. B. Morrison, 66 Milford Ave., Newark, Secretary.
New Mexico Medical Society, Clovis, May 13-15. Dr. L. B. Cohenour, 219 West Central Ave., Albuquerque, Secretary.
New York, Medical Society of the State of, Rochester, May 24-26. Dr. Peter Irving, 2 East 103d St., New York, Secretary.
North Carolina, Medical Society of the State of, Winston-Salem, May 3-5. Dr. L. B. McBrayer, Southern Pines, Secretary.
North Dakota State Medical Association, Grand Forks, May 16-18. Dr. Albert W. Skelsey, 20½ North Broadway, Fargo, Secretary.
Ohio State Medical Association, Dayton, April 28-29. Mr. C. S. Nelson, 79 East State St., Columbus, Executive Secretary.
Oklahoma State Medical Association, Tulsa, May 10-12. Dr. L. S. Willour, 203 Ainsworth Bldg., McAlester, Secretary.
Rhode Island Medical Society, Providence, June 2-3. Dr. Guy W. Wells, 124 Waterman St., Providence, Secretary.
Society for the Study of Asthma and Allied Conditions, Atlantic City, N. J., May 1. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
South Dakota State Medical Association, Rapid City, May 24-26. Dr. John F. D. Cook, Langford, Secretary.
Texas, State Medical Association of, Fort Worth, May 10-13. Dr. Holman Taylor, 1404 West El Paso St., Fort Worth, Secretary.
West Virginia State Medical Association, Clarksburg, May 24-26. Mr. Joe W. Savage, Public Library Bldg., Charleston, Executive Secretary.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

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Preparation of Patient for Delivery. A. First, Philadelphia.—p. 234.
Conduct of First Stage of Labor. W. E. Studdiford, New York.—p. 236.
Treatment of Third Stage of Labor. J. L. Baer, Chicago.—p. 246.
Resuscitation of the New-Born. A. A. Marchetti, New York.—p. 259.
Postpartum Care. F. L. Adair, Chicago.—p. 267.
Syphilis in Pregnancy W. T. Daily, Brooklyn.—p. 281.
Pregnancy and Tuberculosis. H. B. Matthews, Brooklyn.—p. 293.
Diagnosis and Treatment of Abortion. A. H. Morse, New Haven, Conn.—p. 331.
*Prevention and Control of Puerperal Infection Due to Beta Hemolytic Streptococcus. R. G. Douglas, New York.—p. 352.
Newer Aspects of Pelvimetry. H. Thoms, New Haven, Conn.—p. 372.
Management of Transverse Presentation. A. K. Paine, Boston.—p. 383.
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Justifiable Use of Obstetric Forceps. J. A. Harrar, New York.—p. 391.
Indications and Technic of Episiotomy. H. C. Taylor Jr., New York.—p. 403.
Retained and Adherent Placenta. A. C. Beck, Brooklyn.—p. 430.
Management of Abruptio Placentae: Review of Sixty-Five Cases. C. A. Gordon, Brooklyn.—p. 442.
Sterilization at Cesarean Operation. J. T. Smith, Cleveland.—p. 457.

Prevention and Control of Puerperal Infection Due to Beta Hemolytic Streptococcus.—Douglas states that hemolytic streptococcus infections are nearly always exogenous. The organisms are brought to the genital tract by the attendants or somewhat less frequently by the patient herself. Ascending infections, which represent a large percentage of the total incidence of the disease, are caused by organisms present in the vagina at the onset of labor, the chief example being anaerobic streptococcus infections. They may become invasive during labor or the puerperium because of changes either in the general condition of the patient or in the tissues of the genital tract initiated by labor and the puerperium. Contaminated material from the rectum can be carried into the vagina, during vaginal examinations or through operative intervention. In instances of infection arising in this manner, cultures of the lochia may yield such organisms as the colon bacillus, anaerobic gas bacilli (Welch bacillus) and various types of the nonhemolytic streptococcus. Contaminated urine may spontaneously carry the infecting organisms, usually members of the colon group, directly into the vagina. Organisms due to ineffective sterilization or disinfection are present on the hands of the obstetrician or the skin of the patient or on instruments or supplies used during labor or the puerperium and are carried directly or indirectly to the genital tract of the patient. One or more of these factors may play a part in any given case.

Annals of Internal Medicine, Lancaster, Pa.

10: 1085-1266 (Feb.) 1937

Tuberculosis of Pericardium: Study of Twenty Cases. C. S. Keefer, Boston.—p. 1085.
Fulminating Septicemia Associated with Purpura and Bilateral Adrenal Hemorrhage (Waterhouse-Friderichsen Syndrome): Report of Two Cases with Review of Literature. M. S. Sacks, Baltimore.—p. 1105.
Variations in Response to Therapy in Pernicious Anemia. L. Mary Moench, New York.—p. 1115.
Arachnodactyly and Status Dysraphicus: Review. R. H. Pino, E. L. Cooper and S. Van Wien, Detroit.—p. 1130.
Clinical Manifestations and Studies in Parenchymatous Hepatitis. H. A. Freund, Detroit.—p. 1144.
Pain and Pain Equivalents in Heart Disease. C. T. Burnett, Denver.—p. 1156.
*Angina Pectoris and Pernicious Anemia (Old Terminology): A Résumé of Literature, with Case Report. H. Stalker, Detroit.—p. 1172.
Bodily Build and Heredity in Coronary Thrombosis. Grace A. Goldsmith and F. A. Willius, Rochester, Minn.—p. 1181.
*Effectiveness of Trichlorethylene in Preventing Attacks of Angina Pectoris. W. S. Love Jr., Baltimore.—p. 1187.

Angina Pectoris and Pernicious Anemia.—Stalker reports a case of angina pectoris and hyperchromic macrocytic anemia (with aortic stenosis and regurgitation, coronary sclerosis, cardiac asthma and idiosyncrasy for morphine), with a summary of the literature bearing on this symptom complex. The anginal pains were relieved with glyceryl trinitrate but were less frequent when the blood picture approximated the normal or at least improved when a higher blood count was obtained. The theory has been propounded that anoxemia is a factor initiating angina, and it is conceivable that, in pernicious anemia, blood of poor quality might readily aid in the development of an anginal spell on slight provocation. Because the age period of these two diseases is approximately the same it may be a natural occurrence that they are found together in the same patient. It was felt by one investigator that patients with anemia do not often develop angina because of their general easy fatigue, which causes them to stop short of the danger point. But, as most patients with pernicious anemia do not have angina, the anemia alone cannot be a primary cause. Again, the pathologic changes in the heart muscle in pernicious anemia have been thought to be due to lack of oxygen from the fact that the coronary circulation is taxed to the upper limit, comparable to the effects of strenuous work. In general the consensus has been that there were no diagnostic abnormalities in the electrocardiograms and what changes were noted could be traced to a coincident cardiosclerosis.

Trichlorethylene in Preventing Attacks of Angina Pectoris.—At the suggestion of David Bryce, Love investigated the effect that trichlorethylene may have in preventing attacks of angina pectoris. Twenty-seven patients were given from two to four, usually three, inhalations of trichlorethylene daily. Sealed frangible glass ampules of 1 cc. are crushed in a handkerchief. The first inhalation has always been taken in the presence of a physician so that the immediate effect might be noted and the patient reassured, if alarmed. Thereafter, patients are advised to take the drug either while reclining or sitting, for marked lightheadedness often occurs and occasionally there is a brief loss of consciousness. The treatment is continued for three weeks. If no therapeutic effect has been achieved in this time, the use of trichlorethylene has been discontinued and the method considered ineffective. Should the treatment prove effective, the number of inhalations is reduced in each individual to the minimum consistent with adequate relief of symptoms. Lightheadedness lasts only a few moments and leaves the patient mentally clear. When the patient has been nervous and irritable and sleep has been restless, well marked sedation, loss of irritability and quiet sleep have usually followed the use of the drug. Six patients have been given trichlorethylene during immediate attacks of pain due to coronary thrombosis. In three of four cases seen within twelve hours of the onset of coronary thrombosis trichlorethylene afford relief from pain, proving more useful than morphine in one case and less useful in one case. In one case trichlorethylene was ineffective. In two more cases relief of pain followed the use of this drug but, because of the length of time elapsing from the occurrence

of the thrombosis to the initiation of inhalation treatment, disappearance of the pain cannot with certainty be attributed to the treatment. It is possible that trichlorethylene was more effective than morphine in one of these cases. When successfully used, it had the advantage over morphine of not causing constipation. Of the remaining twenty-one patients, eighteen had either arteriosclerosis or arteriosclerosis and hypertension combined. All these patients presented angina pectoris as a symptom of their disease. Of these twenty-one patients anginal seizures were prevented completely by the inhalations in eight; they were definitely diminished in frequency and severity in eight and moderately diminished in one. Four patients received no benefit from the inhalations. In seven patients it was noted that the pain recurred as severely as formerly whenever the inhalations were discontinued, the time elapsing before its recurrence varying from twenty-four hours to several weeks. While pure trichlorethylene in the recommended dosage does not seem to be toxic, it should be used with some caution owing to the reported cases of industrial poisoning due to this agent.

Archives of Neurology and Psychiatry, Chicago

37: 479-710 (March) 1937

Histopathologic Studies in Experimental Poliomyelitis. J. A. Luhan, Chicago.—p. 479.
Perivenous Changes in Acute Encephalitis Associated with Vaccination, Variola and Measles. K. H. Finley, Boston.—p. 505.
*Heat Regulation in Chronic Encephalitis. I. Finkelman and W. Mary Stephens, Chicago.—p. 514.
Neurologic Mechanism Concerned in Epileptic Seizures. P. I. Yakovlev, Waltham, Mass.—p. 523.
Structure of Nerve Root: I. Nature of Junction Between Central and Peripheral Nervous System. I. M. Tarlov, Montreal.—p. 555.
Phosphorus Content of Blood Serum During Epileptic Seizure. A. Weil and E. Liebert, Chicago.—p. 584.
*Trichiniasis Involving Nervous System: Clinical and Neuropathologic Review, with Report of Two Cases. H. Most and M. M. Abeles, New York—p. 589.
Effects of Sodium Amytal and Other Drugs on Reactivity of Hypothalamus of Cat. J. H. Masserman, Chicago.—p. 617.
Coincidence of Interparietal Syndrome and Automatic Changes of Posture in Case of Schizophrenia. L. von Angyal, Budapest, Hungary.—p. 629.
*Use of Trichlorethylene in Treatment of Migraine: Preliminary Report, with Study of Six Cases. H. S. Rubinstein, Baltimore.—p. 638.
Neural Mechanisms Controlling Palmar Galvanic Skin Reflex and Palmar Sweating: Consideration of Available Literature. C. W. Darrow, Chicago.—p. 641.

Heat Regulation in Chronic Encephalitis.—Finkelman and Stephens compared the increase in the oxygen consumption (metabolism or heat production) and the ability to maintain the normal body temperature in patients with chronic encephalitis and in normal subjects on exposure to cold. There was a greater gain in oxygen consumption in normal subjects on exposure to cold than in patients with chronic encephalitis. The least gain in oxygen consumption occurred in patients with chronic encephalitis treated with atropine. More marked differences were noted in the body temperatures on exposure to cold. Eight of the normal subjects showed an increase of temperature on exposure (overcompensation), whereas only one of the patients with chronic encephalitis, who was receiving treatment with atropine, reacted with an elevation of temperature. All the other patients reacted with a lowering of body temperature on exposure. There was a greater drop in the temperature of the normal subjects after the bath. This reaction did not occur, as a rule, in patients with chronic encephalitis, as after the bath the oral temperature did not drop further but rose instead. It is probable that the normal vasodilatation or reactive hyperemia did not occur in patients with chronic encephalitis. There was a greater loss in temperature as well as a lower oxygen consumption rate in the patients with chronic encephalitis while they were treated with atropine than after the use of atropine had been discontinued. The basal metabolic rate in patients with chronic encephalitis was higher than that in the normal subjects (average, 25.25 per cent as compared with —2.7 per cent). With treatment with atropine the metabolic rate in cases of chronic encephalitis was reduced, although it was still above normal. There was no correlation between the rigidity and tremors and any of the observations noted.

Trichinosis Involving Nervous System.—Most and Abeles epitomize the literature relating to the clinical manifestations and neuropathologic changes in trichinosis of the nervous system. They cite two additional cases of trichinosis in which the mental and neurologic signs predominated. The mental picture was that of mild acute encephalitis in one case and of a chronic encephalopathic process with Korsakoff's features in the other. There were no clinical signs of meningeal irritation. Neither trichinae nor alterations in the number of cells and the globulin content were observed in the spinal fluid in either case. Focal neuralgic signs in the form of hemiparesis were seen in one case. Massive anasarca and other changes simulating the wet form of beriberi were observed in the patient who recovered, and failure of eosinophilia to develop was observed in the patient whose illness terminated fatally. A pathologic study including the nervous system was made in one case. Larvae of Trichinella spiralis were demonstrated in the brain substance. The pathologic changes seen in the brain were in the nature of widespread acute nonsuppurative encephalitis. The characteristic changes were the disseminated nodules, with and without parasites, and the perivascular and meningeal infiltrations, as well as the degenerative changes seen in most toxic conditions of considerable duration.

Trichlorethylene in Treatment of Migraine.—Because of the supposed association between trichlorethylene and the trigeminal nerve and because of the preponderant innervation of the dura by the trigeminal nerve, Rubinstein deemed it advisable to use this drug in the treatment of six patients having migraine. It appears that trichlorethylene is a valuable adjunct in the treatment of migraine. This opinion is based on the fact that during the year of its trial on the six patients consistently beneficial results were obtained. The use of the drug is not to serve as a substitute for a painstaking survey, since it is questioned whether the striking results obtained in case 1 would have occurred if the patient had not simultaneously been treated for the defects in personality and endocrine function. The probability concerning the mode of action of the drug is certainly against its direct influence on the underlying cause of the condition, since in accordance with the theories concerning the etiology of migraine it is almost certain that trichlorethylene fails to strike at the root of the difficulty.

Archives of Ophthalmology, Chicago

17: 399-578 (March) 1937

Educational Standards of Ophthalmology That Must Be Met at This Time. W. B. Lancaster, Boston.—p. 399.
Application of After-Image Test in Investigation of Squint. A. Bielschowsky, Hanover, N. H.—p. 408.
The Principal Drainage Channels of the Eye. P. F. Swindle, Milwaukee.—p. 420.
Choroideremia. A. J. Bedell, Albany, N. Y.—p. 444.
Chemistry of Lens: VIII. Lenticular Metabolism. A. C. Krause, Chicago.—p. 468.
Circulation of Aqueous: VI. Intra-Ocular Gas Exchange. J. S. Friedenwald and H. F. Pierce, Baltimore.—p. 477.
The Eye in Epilepsy. L. L. Mayer, Chicago.—p. 486.
Boeck's Sarcoid of Eyelid with Coexisting Darier-Roussy's Sarcoid: Report of Case, with Review of Literature. H. C. Ernsting, Springfield, Ohio.—p. 493.
Fish Lens Protein and Cataract: I. Therapeutic Value. R. F. Shropshire, St. Marys, Pa.—p. 505.
Id.: II. Chemical Studies. R. F. Shropshire, St. Marys, Pa.—p. 508.
Cataract Due to Dinitrophenol: Report of Cases. E. E. Hessing, San Francisco.—p. 513.
Retinal Allergy: Report of Case. J. S. Plumer, Pittsburgh.—p. 516.
Use of Suture in Extraction of Cataract. E. C. Ellett, Memphis, Tenn.—p. 523.

Archives of Otolaryngology, Chicago

25: 119-234 (Feb.) 1937

Use of Sulfur Dioxide in Treatment of Epidemic Cold. A. G. Rawlins, San Francisco.—p. 119.
Statistical Study of Allergic (Vasomotor) Rhinitis. J. A. Clarke Jr. and H. L. Rogers, Philadelphia.—p. 124.
Pathologic Change in Olfactory Nasal Mucosa of Albino Rats with "Stunted" Olfactory Bulbs. C. G. Smith, Toronto.—p. 131.
Complete Apicectomy (Mastoidotympano-Apicectomy): New Technic for Complete Exenteration of Apical Carotid Portion of Petrous Pyramid. J. Lempert, New York.—p. 144.
Treatment of Tinnitus Aurium by Intravenous Use of Local Anesthetic Agents. R. B. Lewy, Chicago.—p. 178.
Thrombosis of Sigmoid Sinus: Clinical Analysis. J. H. Maxwell, Ann Arbor, Mich.—p. 184.
Experimental Evidence for Basic Theory of Vibrotactile Interpretation of Speech. R. H. Gault and L. D. Goodfellow, Evanston, Ill.—p. 190.
Spreading Osteomyelitis of Frontal Bone Secondary to Disease of Frontal Sinus, with Preliminary Report as to Bacteriology and Specific Treatment. H. L. Williams and F. R. Heilman, Rochester, Minn.—p. 196.

New England Journal of Medicine, Boston

216: 273-326 (Feb. 18) 1937

Primary Cranial and Intracranial Epidermoids and Dermoids. D. Munro and W. Wegner, Boston.—p. 273.
The Management of Chronic Alcoholism in England, Scandinavia and Central Europe. R. Fleming, Boston.—p. 279.
*Gum Acacia in Treatment of Nephritic Edema: Report of Case. J. A. Boone, Boston.—p. 289.
Closed Reduction of Fractures of Os Calcis. C. W. Goff, Hartford, Conn.—p. 293.
Acute Intestinal Obstruction Following Hernia into Ascending Mesocolon: Case Report. J. W. Chamberlain, Boston.—p. 299.

216: 327-370 (Feb. 25) 1937

Present Methods of Treating Varicose Veins. H. H. Faxon, Boston.—p. 327.
Pancreatic Cyst: Report of Case. E. L. Young Jr., Boston.—p. 334.
Coarctation of Aorta: Report of Two Unusual Cases. W. H. Goodson Jr., Liberty, Mo.—p. 339.
Suction Tube for Ileostomy. R. Lium, Jamaica Plain, Mass.—p. 345.

Acacia in Treatment of Nephritic Edema.—From his review of the limited literature on the subject and from his experience with a case, it seems to Boone that acacia may eventually prove to be of definite value in the treatment of hypoproteinemic edema that fails to respond to the usual measures. Its effect in greatly increasing the blood volume would seem to contraindicate its use in patients with any evidence of cardiovascular disease. This contraindication would probably apply to the hypoproteinemic edema of beriberi because of the myocardial weakness that is so frequently a feature of that disease. If a history of allergy is obtained, the drug should be given most cautiously, and careful skin tests should be done before each injection, whether the patient is allergic or not. The solution should be carefully prepared and freshly made up, unless it is prepared with sodium chloride, and should be given slowly. The preparation of the solution is a difficult and tedious procedure, and some authors have used a 30 per cent solution in 100 cc. ampules marketed by a large pharmaceutical house. Some investigators have felt that the acacia appears to exert a curative effect on the renal lesion, but the author was unable to observe that acacia had any beneficial effect other than the removal of edema and its attendant symptoms.

New York State Journal of Medicine, New York

37: 349-460 (Feb. 15) 1937

Clinical Evaluation of Protamine Insulin. H. G. Jacobi, New York.—p. 349.
What Treatment of Syphilis Accomplishes. P. A. O'Leary, Rochester, Minn.—p. 365.
Empyema of Pericardium: Pyopericardium. D. H. Hallock, Southampton.—p. 372.
Muscle Injuries. C. W. Henson, New York.—p. 378.
Fever Therapy in Psychiatric Practice. P. R. Vessie, Briarcliff Manor.—p. 385.
Review of Radiographs of Infectious Arthritis: Twenty-Four Cases: One to Four Years Following Fever Therapy. S. C. Davidson and S. L. Warren, Rochester.—p. 387.
*Adenomas: Relation to Rectocolonic Carcinoma. F. C. Yeomans, New York.—p. 390.
Traumatic Subcutaneous Emphysema of Thoracic Origin. J. B. Stenbuck, New York.—p. 395.
Anal Abscess and Anal Fistula: Etiology and Treatment. J. C. M. Brust, Syracuse.—p. 400.
Extensive Plexiform Neuroma of Neck. H. W. Meyer, New York.—p. 403.
Endocrine Disturbances Simulating Surgical Conditions of Abdomen. C. W. Lester, New York.—p. 406.

Adenomas and Rectocolonic Carcinomas.—Yeomans believes that sigmoidoscopy should be done in every patient having symptoms referable to the colon or rectum, such as hemorrhoids, rectal bleeding, pain or discomfort, sciatica, persistent diarrhea, progressive constipation or a feeling of incomplete relief after evacuation. Any growth, however small and innocent in appearance, should be destroyed by fulguration or, if excised, submitted to a competent tumor pathologist. In his thirty-five cases of solitary adenomas, thirteen proved to be malignant. Prompt removal of an adenoma is the only guaranty against its later change into adenocarcinoma. A follow-up examination at intervals of six months for three years should be made. Multiple polyposis and adenomatosis coli are grave conditions requiring major surgery for relief. Convincing proof is presented of malignant degeneration, frequently multicentric, in both groups of disseminated growths. Adenomas develop particularly in the cancer age and their number more closely approaches the number of cancers in the sigmoid and rectum than elsewhere in the gastro-intestinal tract. Doubtless carcinoma of the colon and rectum is frequently mediated through an adenoma, but it cannot be affirmed as yet that all rectocolonic cancers originate from adenomas.

Pennsylvania Medical Journal, Harrisburg

40: 325-408 (Feb.) 1937

Diabetes. E. P. Joslin, Boston.—p. 325.
*Diabetic Arteriosclerosis. T. A. Henderson, Abington.—p. 329.
Fluctuations in Blood Sugar in Diabetics. C. W. W. Elkin, Pittsburgh.—p. 334.
Diabetes Mortality Approaches That of Tuberculosis. J. D. Paul, Philadelphia.—p. 337.
Coincident Diabetes and Tuberculosis. Ruth W. Wilson, Beaver.—p. 342.
Insulin Atrophy. J. A. Shelly, Ambler.—p. 347.
Experimental Studies on Effects of Insulin, Protamine Insulin and Crystalline Insulin. J. H. Barach, Pittsburgh.—p. 349.
Position of County Medical Society in Social Aspects of Medical Service. F. F. Borzell, Philadelphia.—p. 352.

Diabetic Arteriosclerosis.—By injecting metallic mercury into the popliteal artery and taking roentgenograms of the entire leg below the knee, Henderson has studied the gross pathologic changes in the arterial channels of seven diabetic legs which have come to amputation. The mercury was introduced at approximately systolic blood pressure, so that a rough approximation of physiologic conditions was produced. As metallic mercury will not pass through capillaries, a clear picture of the available arterial channels in a given leg can be obtained. After a study of the roentgenograms the leg was dissected at strategic points and the arteries were studied directly. The order of involvement of the arteries seemed to be posterior tibial, peroneal and anterior tibial. The extent of the arterial changes corresponds much more to the duration of the diabetes than it does to the age of the patient. It seems possible that diabetic arteriosclerosis starts as a patchy affair. It may sometimes occlude a major vessel so rapidly that adequate collateral circulation cannot develop to prevent gangrene. It may sometimes progress slowly, accompanied by the development of good collateral circulation, and eventually involve most of the major vessels in a diffuse process. At this stage it either resembles or is identical with nondiabetic or senile arteriosclerosis. In the slowly developing cases the collateral vessels, though never able to deliver a normally rich supply of arterial blood to the part, seem often to be sufficient to keep the patient symptom free or to diminish only slightly his activity and comfort if infection is avoided. Infection seems to be the precipitating factor.

Public Health Reports, Washington, D. C.

52: 157-188 (Feb. 5) 1937

Salient Public Health Features of Rheumatic Heart Disease. O. F. Hedley.—p. 164.
Control of Chronic Acid Mists from Plating Tanks. E. C. Riley and F. H. Goldman.—p. 172.

Radiology, Syracuse, N. Y.

28: 131-260 (Feb.) 1937

Cancer of Thyroid in Children. H. F. Hare, Boston.—p. 131.
X-Ray Diffraction Studies of Globular Proteins: II. Hemoglobins. G. L. Clark and J. H. Shenk, Urbana, Ill.—p. 144.
*Circular Lesion of Pulmonary Tuberculosis. C. C. Birkelo and J. A. Kasper, Detroit.—p. 157.
Effect of Roentgen Rays on Growth of Mouse Sarcoma 180 Irradiated in Vivo. K. Sugiura, New York.—p. 162.
*Roentgen-Ray Evidence of Metastatic Malignancy in Bone. H. Snure and G. D. Maner, Los Angeles.—p. 172.
Intravenous and Intraduodenal Administration of Radio-Sodium. J. G. Hamilton and R. S. Stone, San Francisco.—p. 178.
New and Apparently Useful Biologic Indicator of X-Ray Dosage: Note. C. P. Haskins, Schenectady, N. Y., and E. V. Enzmann, Cambridge, Mass.—p. 189.
Roentgen Kymographic Studies of Cardiac Conditions. W. G. Scott, S. Moore and H. A. McCordock, St. Louis.—p. 196.
*Use of Pentobarbital Sodium for Roentgen Nausea and Vomiting. W. C. Popp and M. W. Binger, Rochester, Minn.—p. 211.
Heat as a Sensitizing Agent in Radiation Therapy of Neoplastic Diseases. W. H. Meyer and A. Mutscheller, New York.—p. 215.
End Results of Injuries to Epiphyses. O. Lipschultz, Minneapolis.—p. 223.

Circular Lesion of Pulmonary Tuberculosis.—Birkelo and Kasper base their dissertation on sixty cases of pulmonary tuberculosis selected on the basis of their circular outline. Most of these cases have been observed for more than a year, some for periods of from five to six years. While some of the circular lesions were observed to develop from originally diffuse tuberculous infiltration, others were circular at the time of the

first observation. A small group includes those which appear to represent the final stage of a primary or childhood type of infiltration. Contrary to the belief of previous observers, it is felt that some circular lesions develop from first infection. According to the authors' observations, the circular lesions may be divided into three groups. The first group includes the lesions that have been found to develop from diffuse infiltration. Such lesions are not entirely stationary and may undergo excavation. Most of them, however, show a tendency to become smaller. The second group includes the lesions that are definitely circular when first discovered. They may be single or multiple but in most instances are solitary lesions varying in size from 0.5 to 3 cm. in diameter. Most of them are of uniform density and well defined in outline; they are definitely in the parenchyma. Occasionally they excavate and may cause a spread of the tuberculous disease. These lesions remain stationary for months and years and probably represent the well encapsulated type, which is least likely to become active. The third group includes the receding stage of the childhood type of infiltration. At first the lesions of this group were found to be definitely circular; later they retrogressed without any collapse therapy. It would appear that the lesions of the second group require only periodic check up. In the event that excavation should begin, the indication would be for some therapeutic intervention. Three cases showed evidence of excavation, while thirty-six remained inactive. The lesions in the first group represent incomplete healing with the possibility of incomplete encapsulation. Since the majority of sixteen cases showed retrogression, it would be justifiable to conclude that their outlook for satisfactory recovery would be good and that one might expect eventual disappearance of the lesion or complete encapsulation. No additional suggestions can be advanced for the lesions in the third group except to emphasize that continued observation of the lesions is a necessity.

Roentgen Evidence of Metastatic Malignancy in Bone.—Several years ago, following a necropsy on an extremely emaciated individual, Snure and Maner reviewed the roentgenograms of his lumbar spine, which had indicated changes in the fifth lumbar body alone. Necropsy showed macroscopic evidence of metastatic malignant changes throughout most of the vertebral bodies. Microscopic examination proved that tumor cells had replaced most of the marrow cells without destroying the trabeculae of the spongiosa; however, there were several areas, about 1 cm. in diameter, where the trabeculae were destroyed that could not be demonstrated on the roentgenogram. Following this observation they removed a V-shaped section of bone from the vertebral bodies of all patients dying of a malignant condition when necropsy was permitted. To avoid distortion due to the spine-film distance or to the superimposed shadows, they sawed the spinal column lengthwise in the sagittal plane and placed one half directly on the film holder; even under these conditions the larger areas of destruction were not demonstrable on the roentgenogram. It is surprising how frequently metastatic malignant change is present in the vertebrae without clinical signs and without evidence on roentgenograms that have excellent detail and quality. By merely taking a wedge of bone about 0.5 cm. in thickness from the lumbar vertebrae they found several cases of malignant metastatic growths originating from primary carcinoma of the liver, tongue, stomach, gallbladder, urinary bladder, pancreas, rectum and other organs supposed to metastasize but rarely to the osseous structures. The largest number of metastases to the vertebrae was secondary to breast and prostatic carcinoma. The best method of study would be that suggested by Fraenkel of sectioning and roentgenographing all bones of the body.

Pentobarbital Sodium for Roentgen Nausea and Vomiting.—Their careful study of 175 patients who had received pentobarbital sodium, in all of whom nausea and vomiting was expected to occur after treatment, revealed that 61.1 per cent received complete relief from roentgen sickness, 18.3 per cent had only moderate nausea, 10.9 per cent had nausea with a very slight amount of vomiting, and 9.7 per cent obtained no relief. Popp and Binger found that the administration of 3 grains (0.2 Gm.) of pentobarbital sodium as a suppository immediately following a session of treatment was most successful. Since pentobarbital sodium is easily available, inexpensive, easily administered, and in their experience without harmful effects, they feel that its use in controlling roentgen nausea and vomiting is definitely indicated.

Southern Medical Journal, Birmingham, Ala.

30: 243-354 (March) 1937. Partial Index

Roentgen Treatment of Infections. W. F. Manges, Philadelphia.—p. 243.
*Bone Changes in Sickle Cell Anemia. L. W. Diggs, H. N. Pulliam and J. C. King, Memphis, Tenn.—p. 249.
Diverticulum of Urinary Bladder. N. S. Moore, St. Louis.—p. 263.
Lupus Vulgaris in the Far South. E. D. French and R. Lefholz, Miami, Fla.—p. 270.
Mass Control of Syphilis. R. A. Vonderlehr and L. J. Usilton, Washington, D. C.—p. 281.
Morbid Anatomic Changes Following Artificial Fever: Report of Autopsies. E. L. Wilbur and J. B. Stevens, Durham, N. C.—p. 286.
Study of Vaginal Flora in Normal Female. B. Carter and C. P. Jones, Durham, N. C.—p. 298.
Prevention of Deaths from Measles. H. Williams, Baltimore.—p. 304.
Carcinoma of Gallbladder: Studies of Twenty-Four Cases in Georgia. R. L. Rhodes and R. B. Greenblatt, Augusta, Ga.—p. 315.
Acute Infections of Middle Ear and Mastoid Cells. J. J. Shea, Memphis, Tenn.—p. 322.
Diseases of Nervous System Caused by Nutritional Deficiency. E. Wexberg, New Orleans.—p. 334.
Dietary Deficiencies as Cause of Anemia. P. W. Clough, Baltimore.—p. 342.

Bone Changes in Sickle Cell Anemia.—Diggs and his associates attempt to summarize the known facts concerning the pathology and roentgen appearance of bones in sickle cell anemia based on the recorded observations of other investigators and observations made at the John Gaston Hospital. Thirty-nine Negroes with active and severe sickle cell anemia have been studied clinically. Eight necropsies have been performed. In each necropsy the bone marrow was examined, in five the skull was examined and in three one or more long bones were sectioned. The pathologic material has been supplemented by microscopic sections of bones. The bones of thirty Negroes with sickle cell anemia have been studied roentgenologically, the total number of roentgenograms being 259. For controls the files of the fracture clinic were used. The gross microscopic and roentgen appearance of the bones in sickle cell anemia indicates that the bone marrow is primarily involved. Two factors appear to be working in opposite directions: the hyperplastic marrow tends to increase its volume at the expense of bone and the sclerosing factors tend to replace the marrow and to substitute in its place osteoid tissue or new bone. The excessive and abnormal growth activity of the marrow has, as a rule, no significant effect on the bony cage within which it is confined, and such effects as it does have are maximal in the bones that are normally engaged in blood cell formation, such as the skull and cancellous bones of the trunk. In these bones osteoporosis is dominant. In the long bones in which normal hematopoiesis does not occur, sclerosis is dominant. In the most distal bones of the hands and feet in which marrow is absent the changes are minimal. The combination of marrow expanding and marrow replacing processes leads, if the patient lives long enough, to gross anatomic derangements in the bone structure.

Texas State Journal of Medicine, Fort Worth

32: 639-720 (Feb.) 1937

Rational Treatment of Peptic Ulcer According to Physiologic Principles. A. Ochsner, New Orleans.—p. 645.
Surgery of Recurrent Exophthalmic Goiter. A. C. Scott Jr., Temple.—p. 649.
Apical Cavity in Tuberculous: Its Management. J. W. Nixon, San Antonio.—p. 653.
Appendicular Colic in Childhood. K. H. Aynesworth, Waco.—p. 655.
Acute Appendicitis. J. G. Burns, Cuero.—p. 662.
Cataract Extraction: Recent Modalities—Improved Technic—Better Results. O. B. Nugent, Chicago.—p. 664.
Otitic Meningitis. W. D. Jones, Dallas.—p. 672.
Procaine Crystals Topically Applied as Local Anesthetic in Nasal Surgery. V. D. Rathgeber, Fort Worth.—p. 677.
Some Obstetric Complications Due to Anomalies of Lower Uterine Segment. H. W. Johnson, Houston.—p. 678.
Recent Advances in Treatment of Diabetes Mellitus. E. H. Rynearson, Rochester, Minn.—p. 680.
Fungus Infections and Their Allergic Manifestations. W. F. Spiller and H. E. Prince, Galveston.—p. 684.
Aberrations of Pancreas. G. Turner, El Paso.—p. 689.
Experimental Fat Necrosis. M. P. Neal, Columbia, Mo.—p. 691.
Spontaneous Pneumothorax. P. M. Bassel, Temple.—p. 696.
Mental Hygiene as a Public Health Measure. T. H. Harris, Galveston.—p. 700.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Ophthalmology, London

21: 65-112 (Feb.) 1937

Familial Hyaline Dystrophy in Fundus Oculi or Doyne's Family Honeycomb "Choroiditis." M. Tree.—p. 65.
Bilateral Ganglionic Neurogliomas of Face: Case. J. G. Clegg and F. C. Moore.—p. 92.
"Infantile and Congenital Retinal Fold." A. Tillema.—p. 94.

British Journal of Surgery, Bristol

24: 421-636 (Jan.) 1937

Rotation at Shoulder: Critical Inquiry. L. McGregor.—p. 425.
Mallet Finger. I. S. Smillie.—p. 439.
Blood Pressure During Spinal Anesthesia. E. F. Hill.—p. 446.
Pathologic Fracture of Humerus Complicating Late Secondary Syphilis. H. J. Burrows.—p. 452.
Comparison of Results of Spinal Fixation Operations and Nonoperative Treatment in Pott's Disease in Adults. G. K. McKee.—p. 456.
Gastroscopy: Its History, Technic and Clinical Value, with Report on Sixty Cases. H. Taylor.—p. 469.
Funnel-Neck Deformity of Bladder. J. B. Macalpine and D. S. P. Wilson.—p. 501.
*Association of Inguinal Hernia with Traumatic Perforation of Intestine. I. Aird.—p. 529.
Chronic Peptic Ulcer of Esophagus: Report of Eight Cases. A. Lyall.—p. 534.
Renal Rickets. N. L. Price and T. B. Davie.—p. 548.
Cholesterosis of Gallbladder: Review, Supplemented by Personal Observations on Eighty-Seven Cases. W. A. Mackey.—p. 570.
*Toxin Formation in Burned Tissues. W. C. Wilson, J. S. Jeffrey, A. N. Roxburgh and C. P. Stewart.—p. 601.

Inguinal Hernia and Traumatic Perforation of Intestine.—Aird discusses the relation that inguinal hernia bears to traumatic perforation of the intestine, as the result of direct injury to the hernia or abdominal wall or indirectly as the result of excessive muscular effort. When the causative violence has been applied directly to the hernia, the intestine is ruptured as it lies unprotected in the hernial sac. In injury by a force applied to a point on the abdominal wall remote from the hernia it can be presumed that a fixed loop of intestine is more liable to injury than is a freely movable loop that can be dislodged in safety by a force applied to the abdomen. Ruptures of the intestine resulting from violent hyperextension of the trunk, without direct injury to the abdomen, are still less easily explained. To account for these cases, Bunge points out that any sudden rise of intra-abdominal pressure is invariably associated with a coincident rise in intra-intestinal pressure. In the normal abdomen such a rise is of little consequence, since the pressure within the intestine is equal to the pressure around it. If at the time of sudden elevation of intra-abdominal pressure a loop of intestine overlies the mouth of a hernial sac, and a rise of pressure consequently occurs in that intestinal loop, the loop lacks the support of the intra-abdominal pressure at a localized point on its surface, protrudes downward into the sac in which no rise of pressure has occurred, and bursts at that unsupported point. When the intra-abdominal pressure falls again, the ruptured loop moves away from the abdominal ring and discharges its content through the perforation to give a general peritonitis. Ingenious as the theory is, its complexity is a bar to its unqualified acceptance. It would be simpler to explain these cases by overstretching of a loop of intestine, fixed at one end at the ileocecal or duodenojejunal junction and gripped at the other by a contraction of the abdominal muscles around the hernial orifice. A loop of intestine lying within a hernial sac may be injured by violence applied directly to the hernial swelling—the pressure of an ill adjusted truss, or too vigorous attempts to relieve an incarceration. Ruptures of the intestine caused by violence to the abdomen appear to be due to the application of the traumatic force to a doubly fixed and immovable intestinal loop. Ruptures by muscular violence are most simply explained by the overstretching of an intestinal loop between the ileocecal (or duodenojejunal) junction and the abdominal inguinal ring, and distraction of these points of fixation from each other by violent hyperextension of the trunk.

Toxin Formation in Burned Tissues.—In their experiments on rabbits, Wilson and his colleagues demonstrated that edema fluid extracted from a burned area is toxic to healthy animals of the same species. By injecting edema fluid itself, they avoided fallacies connected with methods of chemical extraction. The development of toxicity was slow, probably steady and progressive, up to forty-eight hours at least. Fluid at four hours after injury was not toxic. Clearly the toxic principles were not formed immediately by the action of heat. It was seen that toxic substances could be formed in edema fluid by enzyme action after organisms had been removed by filtering. Therefore it seemed justifiable to conclude that autolysis of injured tissue was the mechanism of toxin elaboration. The actions of edema fluid indicated that more than one toxic substance was present. Some samples had a rapidly lethal, apparently neurotoxic, action which was entirely absent from others. Samples which caused death within a few hours did so by virtue of some component which had many points of community with histamine and other capillary poisons. When edema fluid caused death after a considerable number of hours, there was sometimes little to indicate its mode of action; the chief, though not invariable, effect was to produce degenerative changes in the liver cells. The toxic bodies were associated mainly with the globulin fraction, though the albumin fraction was only slightly less implicated, and thus were brought into the category of protein derivatives. The burned animals were in most instances very little affected by the injury during the period of survival allowed; i. e., forty-eight hours. Since the burned area was of limited extent and the development of toxicity was gradual, the quantity of toxin absorbed during the period of survival would be small. The capacity of animals to survive repeated small doses of toxin was proved in experiments on attempted immunization. A comparison of the toxic effects in animals of injected edema fluid with the clinical condition of acute toxemia is of special interest. In many respects there is a marked similarity; the resemblance is perhaps strongest in the postmortem changes, because the striking and constant feature of fatal toxemia is necrosis and fatty degeneration of the liver cells in the centers of the lobules. Even without these points of similarity, the demonstration of toxin formation in burned areas is in itself suggestive that the action of circulating toxins may play an important part in the systemic disturbances of burns. Taken in conjunction with evidence that in human cases increased concentration of the blood, early bacterial infection and changes in blood chemistry are not essential causes of toxemia, the results of the investigation seem of particular significance.

British Medical Journal, London

1: 153-202 (Jan. 23) 1937

Cancer of the Breast. C. Rowntree.—p. 153.
*Variations of Weight During Pregnancy. M. D. A. Evans.—p. 157.
Lupus Vulgaris, with Especial Reference to Its Treatment with Finsen-Lomholt Lamp. R. Aitken.—p. 160.
Blood Group Tests in Disputed Paternity. D. Harley and G. R. Lynch.—p. 163.
Some Clinical Aspects of Lymphatic System. H. A. Harris.—p. 166.

Variations of Weight During Pregnancy.—Evans declares that it is universally agreed that there is very little variation in weight during the first trimester, some patients losing a little and others gaining, depending probably on the ease with which the body adjusts itself to the presence of the ovum. The increase that occurs must therefore take place during the last six months. The average monthly gain during the second and third trimesters should be between 2 and 4 pounds (0.9-1.8 Kg.) and the total gain between 16 and 18 pounds (7.3-8.2 Kg.). If the gain is greater, the patient should be questioned carefully and be examined in order to find, if possible, the cause of the discrepancy. In the 211 cases under consideration the average increase in weight of a potential toxemic patient was definitely more than that of a normal patient, but it was not sufficient to be of real clinical value, since the 4.3 pounds (2 Kg.) that was found to be the average monthly gain of the toxemic patients was as a rule gained by the normal women during one of their later months. If, however, the patient has a monthly gain of from 4 to 5 pounds (1.8-2.3 Kg.) in two or more consecutive months, it should be regarded as abnormal; dietetic errors, if present, should be rectified and a stricter supervision undertaken. On the other hand, a sudden marked rise in weight during one month is of great help in foretelling a toxemia. If the patient showed a monthly gain of 8 pounds (3.6 Kg.) or

more, there was a 63 per cent chance of her developing a toxemia and, following a 6 to 8 pound (2.7-3.6 Kg.) gain, a 50 per cent chance. It would appear, therefore, that it is the sudden abnormal increase in weight rather than the gradual gain which is of importance in detecting an incipient toxemia. This abnormal gain is as a rule an earlier sign than a raised blood pressure, but occasionally the latter is the first indication. Therefore ideal antepartum supervision should include the taking of the weight and blood pressure each month during the second trimester, with more frequent observations during the last trimester, permitting a diagnosis of toxemia of pregnancy before albuminuria appears. Treatment could then be given and the percentage of the maternal mortality due to the toxemias of pregnancy should be materially reduced. In this way a certain number of the toxemic cases may be avoided; if not avoided, with appropriate and early treatment most of the cases would be less severe.

Journal of Physiology, London

88: 369-512 (Jan. 18) 1937

Water Metabolism in Relation to Menstrual Cycle. P. L. Krohn and S. Zuckerman.—p. 369.

"Sensitization" by Injury of Cutaneous Nerve Endings in Frog. F. Echlin and N. Propper.—p. 388.

Relation of Pituitary to Liver Glycogen Production and Utilization. O. Cope.—p. 401.

Adrenalin and Blood Lactic Acid Level in Hypophysectomized Rabbits. O. Cope and R. H. Thompson.—p. 417.

Study of Carotid Sinus Respiratory Reflexes by Means of Chronic Experiments. D. H. Smyth.—p. 425.

Electric Responses of Dark-Adapted Frogs' Eyes to Monochromatic Stimuli. R. Granit and A. Munsterhjelm.—p. 436.

Effects on Knee Jerk of Stimulation of Central End of Vagus and of Various Changes in Circulation and Respiration. A. Schweitzer and S. Wright.—p. 459.

Action of Adrenalin on Knee Jerk. A. Schweitzer and S. Wright.—p. 476.

Changes in Viscosity of an Unstriated Muscle (Mytilus Edulis) During and After Stimulation with Alternating, Interrupted and Uninterrupted Direct Currents. F. R. Winton.—p. 492.

Lancet, London

1: 185-246 (Jan. 23) 1937

Surgical Treatment of Cardiac Ischemia. L. O'Shaughnessy, introduction by Dawson.—p. 185.

*Is *p*-Aminobenzenesulfonamide the Active Agent in Prontosil Therapy? A. T. Fuller.—p. 194.

Mixed Meningococcic and Streptococcic Meningitis. A. A. Cunningham.—p. 198.

*Overbreathing Tetany: Changes in Calcium of Serum, Serum-Ultrafiltrates and Cerebrospinal Fluid. R. A. McCance and E. Watchorn.—p. 200.

*Cerebrospinal Fluid in Spontaneous Overbreathing Tetany. J. N. Cumings and E. A. Carmichael.—p. 201.

Retroperitoneal Sarcoma of Unusual Distribution. H. Waters, D. Levine and B. Myers, with note on histology by F. A. Knott.—p. 202.

Investigation of Relatives of Patients with Gastric Cancer. A. E. Levin and B. A. Kuchur.—p. 204.

Dangerous Rectal Trauma Due to Rigid Nozzle. D. D. Pinnock.—p. 205.

Cardiovascular Changes Following Arteriovenous Aneurysm. G. B. Price.—p. 206.

The Active Agent in Prontosil Therapy.—Fuller states that in normal animals 35 per cent of the injected sulfanilamide and 49 per cent of the soluble prontosil are not accounted for. A part of these drugs is undoubtedly destroyed in the body. In the case of insoluble prontosil 90 per cent was not recovered, but a large part of this was left behind in the body, staining the tissues an orange color, and excretion was still taking place at the conclusion of the experiment. The discrepancies were greater in infected animals. This may be due to retention by the inflamed tissues or to impairment of kidney function. The infected groups receiving prontosil excreted more sulfanilamide than did the normal groups. In the soluble prontosil experiment equivalent amounts of prontosil and sulfanilamide were excreted, and evidence suggests that half the injected prontosil was reduced. When oral prontosil was also given to patients, a still larger proportion was converted to sulfanilamide. Allowing for the threefold difference in molecular weights, if sulfanilamide is the active agent in prontosil therapy it should be six times as efficient weight for weight as soluble prontosil. This ratio will be affected if there is any great difference in the rates of elimination of sulfanilamide from sulfanilamide-treated and prontosil-treated animals. In the three groups of ten infected mice receiving an average of 25 mg. of soluble prontosil each, seven, seven and five had died by the fifth day. Six of the ten mice receiving 22.5 mg. of sulfanilamide had died by the fifth day. The experiments thus fail to show any great difference between the two drugs, but for adequate protection of the animals many more than the three injections received would have been necessary. The four control mice had died by the second day. If prontosil has more protective power than is accounted for by the sulfanilamide produced from it, this further action must be other than a simple bactericidal one, for prontosil itself has little or no streptococcus-killing power. It is possible that the therapeutic action of prontosil is due to the sulfanilamide derived from it by reduction in the body.

Overbreathing Tetany.—McCance and Watchorn repeated the work of Barnes and Greaves on overbreathing tetany. They selected two subjects: one who suffered from severe attacks of hysterical overbreathing tetany and a normal woman. Tetany began to develop after a period of only two and one-half to three minutes of overbreathing in the normal subject and after three and one-half minutes in the other patient. The serum calcium rose during overbreathing and fell again immediately afterward. This rise is in agreement with the results reported by a number of authors. The ultrafiltrable calcium also rose during overbreathing. The ratio of the ultrafiltrable to the total calcium remained virtually unchanged in the normal subject. The ratio fell slightly in the patient throughout the whole experiment but was always within normal limits. The cerebrospinal fluid calcium did not fall during overbreathing and did not in fact show any significant change. The inorganic phosphorus of the cerebrospinal fluid also showed no significant change during overbreathing. The results do not confirm those of Barnes and Greaves. The results indicate that the ease with which tetany can be induced by overbreathing has little diagnostic significance. The time at which tetany develops and its severity depend on the susceptibility of the subject to the alkalosis so produced. Thus, tetany may not develop clinically until overbreathing has been in progress for some time, but cases have been recorded in women after very slight hyperventilation. Perfectly normal persons may be as susceptible to alkalosis and tetany as those unfortunate people who are liable to attacks of uncontrollable overbreathing and its sequels.

Cerebrospinal Fluid in Spontaneous Overbreathing Tetany.—In their two cases of overbreathing tetany in which the cerebrospinal fluid and blood calcium contents were estimated, Cumings and Carmichael found that there was no appreciable decrease in the cerebrospinal fluid calcium, although a small decrease took place in the serum calcium.

Medical Journal of Australia, Sydney

1: 75-116 (Jan. 16) 1937

Some Phases of Medical Practice in the Twentieth Century. W. Summons.—p. 75.

Scope and Activities of the Commonwealth X-Ray and Radium Laboratory, University of Melbourne. M. J. Holmes and C. E. Eddy.—p. 80.

Some Remarks on Antenatal Supervision. T. G. Wilson.—p. 86.

Some Remarks on Relief of Pain in Childbirth. B. H. Swift.—p. 88.

Treatment of Early Carcinoma of Lip, with Especial Reference to Use of Low Kilovoltage X-Rays. J. C. Belisario.—p. 91.

Journal of Oriental Med., Dairen, S. Manchuria

26: 1-18 (Jan.) 1937

Method of Ascertaining Resistance of Tubercle and Acid-Fast Bacilli by "Test-Tube Bottom Method." T. Hashimoto.—p. 1.

Acute Pancreatitis. K. Mori.—p. 2.

Pityriasis Circinata, Toyama: Case (Pityriasis Rotunda, Matsuura). K. Mori.—p. 4.

Hygienic Problems of Water in Manchuria: III. Standard of Purity to Be Applied to Well Water in Manchuria. T. Kodama, S. Suzuki and M. Takeyoshi.—p. 5.

Angle of Inclination of Upper Middle Incisors of Chinese. S. Ohshima.—p. 8.

Investigations of Biologic Character of Leishmania Donovani: III. Report: Investigations on Necessity for Growth of Leishmania Donovani in Vitro. Y. Saito.—p. 9.

Body Build of Chinese Mountain Workers. S. Takeya.—p. 11.

Postvaccinal Exanthema. T. Akiyama.—p. 13.

Experimentation with Ide's Reaction and a Personal Modification. S. Fukuda.—p. 14.

Lymphogranulomatosis Inguinale (Maladie de Nicolas-Favre): Report III. Immune Biologic Studies of Frei's Reaction in Guinea-Pigs and Rabbits. K. Tasaki.—p. 15.

Id.: Report IV. Intravenous Injections of Frei Antigen for Therapeutic and Diagnostic Purposes. K. Tasaki.—p. 17.

Gynécologie et Obstétrique, Paris

35: 81-160 (Feb.) 1937

Primary Epithelioma of the Clitoris: Case. A. Laffont, J. Montpellier and P. Jacquemin.—p. 81.
Roentgenologic Study of Urinary Stasis in Pregnancy: Ascending Ureteropyelography. X.-J. Contiadès.—p. 95.
*Procedure of Professor Enrigue A. Boero and Action of Formaldehyde on Pregnancy. C. A. Masson.—p. 115.

Action of Formaldehyde on Pregnancy.—In 1935 Boero advocated the use of formaldehyde for the interruption of pregnancy. He claimed that this substance causes the death of the fetus but also its retention for some time, making it possible for the patient to continue the treatment of the disease for which the pregnancy was interrupted. Masson made experiments on animals before he attempted to try formaldehyde injections in pregnant women. He chose rabbits and guinea-pigs because these animals have a uterus bicornis, which often allowed him to experiment on either half of the pregnant uterus. Some animals were in their first gestation, some had had many pregnancies and some rabbits were even older than 3 years. To make an intra-amniotic injection of formaldehyde he had to take recourse to a median laparotomy under ether. Then 1 cc. of a 1 per cent solution of formaldehyde was injected into the amniotic sac. In cases of simple pregnancies the fetal movements ceased immediately, often only after a few convulsive movements. In cases of double pregnancy he could observe the phenomenon of continued fetal movements together with uterine contractions. When the quantity of formaldehyde was increased, both fetuses came out dead. Too much formaldehyde caused hemorrhagic lesions in the uterine wall. It was even possible to complete the gestation of the uninjected fetus while the injected fetus remained dead in its amnion. The author's experiences were approximately the same with guinea-pigs as with rabbits and the results obtained led him to attempt the experiment in pregnant women. After emptying the bladder, he inserted a fine needle about two inches above the pubic bone directly into the amniotic cavity. The amniotic fluid flowed drop by drop into the syringe and could be used later for examination. He injected 1.25 cc. of solution of formaldehyde. The patient experienced some pain in the lower part of the abdomen, but this soon subsided. The pain recurred the next day and again after forty-eight hours with some intensity. In the first case the nurse prematurely opened the amniotic sac and about fifteen minutes later the dead fetus was expelled, followed by the placenta. In all the treated cases, pain and swelling of the breasts developed three days later. The quantity of formaldehyde injected may be larger or smaller than 1.25 cc. of the 40 per cent solution, depending on the gravity of the patient's condition. In one case 0.5 cc. of solution of formaldehyde did not kill the fetus but arrested temporarily the patient's toxemia, and expulsion of a live fetus took place sixty-three days later. In another similar case a second injection of 2 cc. of solution of formaldehyde was necessary nine days later, preceded by extraction of 100 cc. of amniotic fluid. Six days later the dead fetus was expelled by normal uterine contractions.

Schweizerische medizinische Wochenschrift, Basel

67: 153-176 (Feb. 20) 1937. Partial Index

Crystalline Structure of Bone in Its Relation to Physiology and Pathology of Skeleton. C. Henschen.—p. 153.
Anthrax in Human Subjects and Animals in Switzerland. L. Riedmüller.—p. 158.
*Unexpected Late Serologic Relapses After Prolonged and Intensive Specific Syphilis Therapy. H. Loosli.—p. 159.
Progress in Therapy with Lactic Ferments. F. Wyss-Chodat.—p. 161.
Therapy of Angina Pectoris and Question of Digitalis. Leins-Forrer.—p. 163.
Shope's Cottontail Rabbit Papilloma. P. Ladewig.—p. 165.

Relapses After Intensive Syphilis Therapy.—Loosli is of the opinion that, since the introduction of arsphenamine, many have become unduly optimistic concerning the treatment of the early stages of syphilis. Repeated reminders not to regard the general rules as applicable to every case are usually disregarded, and the opinion prevails that, if after the completion of the "three course" system the serologic reactions have been negative several times, the case may be regarded as definitely cured. Nevertheless, relapses do occur. The author reports five cases in which, in spite of intensive therapy, serologic relapses became manifest in one case after almost three years and in the other four after about two years. He emphasizes the necessity of a prolonged control and, in some cases, longer periods of treatment than was formerly customary.

Clinica Medica Italiana, Milan

68: 1-72 (Jan.) 1937

Oxalic Acid Formation: Experiments with Dextrose and Uric Acid. C. Scaglioni.—p. 5.
Permanent Hyperketonemia in Hypothalamic-Hypophyseal Syndrome. (Cushing's): Case. L. Cannavo.—p. 23.
*Presence of Iminazol in Urine in Fatigue. R. Massione and G. Donini. —p. 35.
Latent Cardiovascular Insufficiency: Importance and Diagnostic Method. M. Bassi.—p. 53.

Iminazol in Urine in Fatigue.—Massione and Donini made determinations of iminazol in the urine in fatigued persons and found that it is proportional to the intensity of fatigue. According to the authors, fatigue is a reaction of the body to iminazol similar to the body's reaction to histamine. In both cases the body reacts with an increase of the cardiac beats and with blood hypertension, followed by a decrease of the beats and by hypotension; there are increase of glycemia and decrease of the alkali reserve. Fatigue is probably due to the presence of iminazols in the body, which are formed by destruction of muscular proteins during work. The difference in reaction of the body to iminazols in fatigue and to histamine is due to the lesser toxicity of iminazols compared to that of histamine, because the chemical nature of the substances is different, and also to the probable simultaneous production of antagonistic substances to iminazol during muscular work.

Cuore e Circolazione, Rome

21: 1-60 (Jan.) 1937

Variations of Pulmonary and Aortic Pressure from Experimental Coronary Obstruction. G. M. Cataldi.—p. 2.
*Oculocardiac Reflex in Normal Puberty: Electrocardiographic Study. G. Dagnini.—p. 9.
Cardiac Functional Tests in Compensated Valvular Defects. G. Bassi. —p. 31.

Oculocardiac Reflex in Normal Puberty.—Dagnini studied the behavior of the oculocardiac reflex in 230 normal girls ranging in age from 11 to 17 years. He used an apparatus by which the eyes were subjected to constant pressure of 600 Gm. for ten seconds. The production, intensity, time of latency and duration of the reflex were evaluated by the changes in the electrocardiograph, in lead 1, compared to an electrocardiographic curve taken immediately before compressing the eyes. The electrocardiogram was taken with the girls at rest on a bed. Care was taken to show on the tracings the starting and finishing time of ocular compression. The author considers slowing of the heart rhythm, shown by the electrocardiogram, a positive reflex, regardless of its intensity. The reflex was positive in 64 per cent of the cases when it was evaluated by the duration of a cardiac revolution as compared with that of the electrocardiographic curve at rest. It was positive in 44 per cent of the cases when it was evaluated by the number of beats during the ten seconds of ocular compression in comparison with that obtained in the same interval with the girl at rest. The larger number of positive results (75 per cent) was given by girls who, while being at rest, had a pulse frequency of within 70 and 110 beats per minute. The reflex was less frequent in bradycardia and in tachycardia. In 37 per cent of the cases the electrocardiogram showed the presence of respiratory sinusal arrhythmia. The oculocardiac reflex was positive in 50 per cent of these cases. In 16 per cent of the cases of respiratory sinusal arrhythmia the compression of the eyes made the cardiac rhythm regular. The phase of acceleration that existed in the curve of the patient at rest disappeared during ocular compression. The author's observation gives force to the opinions of those who state that respiratory sinusal arrhythmia originates in a disequilibrium of the right vagus and sympathetic nerves. Ocular compression in these cases makes the vagal tonus predominate over the sympathetic with consequent control of the accelerated phase of the cardiac revolution. The most important modification of the electrocardiogram in lead 1 induced by ocular compression in the author's cases was the diminished amplitude

of the P wave, which was observed in 15 per cent of the cases. Changes of the ventricular complex were not observed. The amplitude of the P wave was most diminished in cases of intense oculocardiac reflex. This fact shows that ocular compression has a general action on the rhythm and a special action on the auricle. In a case of intense reflex an autonomic ventricular contraction took place. There were no disturbances of conduction.

Prensa Médica Argentina, Buenos Aires

24: 229-282 (Feb. 3) 1937

Gonococcic Phlebitis: Case. J. J. Spangenberg and C. R. Belgrano.—p. 229.
*Thoracoplasty, Using Finochietto's Paradoxical Incision. C. Albarracin Godoy.—p. 231.
Asthma and Allergens. J. F. Tourreilles and Marta Brancato.—p. 246.
Chronic Rheumatism. L. Puccio, C. F. Portela and A. Ricchieri.—p. 249.
Neurodocitis of Cubital Nerve Due to Posttraumatic Cubitus Valgus: Cases. J. Michans and R. Roccatagliata.—p. 255.
Acute Appendicitis in Elderly Persons. J. L. Mulcahy.—p. 264.

Thoracoplasty After Finochietto's Technic.—Albarracin Godoy says that Finochietto's technic for partial superior thoracoplasty with "paradoxical" incision was described in *La prensa médica argentina*, Sept. 18, 1935, page 1779. The technic is as follows: A transverse incision, 15 or 18 cm. in length, is made beginning at the midpoint within the acromion and the spinal border of the scapula (1.5 cm. below the spine of the scapula) and is then directed inward so as to cut the scapular angle. The teguments and then the diaphragmatic dorsal muscles are separated. The large dorsal muscle is dissected downward, whereas the rhomboid and the serratus magnus are dissected upward. Separation of the muscles results in the formation of a tunnel, at the floor of which the interserratic aponeurosis and the small serratus are resected and the musculothoracic space is approached. The scapula is displaced outward. Through the operative tunnel the ribs are resected. The operation ends with reparation of the skin, a drain being left. The author reports satisfactory results in several cases. According to him the operation is ideal for paravertebral and subscapular thoracoplasty. It has the following advantages: Lack of section of the muscles, which results in the production of only slight hemorrhage and trauma and no shock; less intense pain during and after the operation than that induced by the thoracoplasty made by other technics; lack of immediate and late complications. The operation is done under regional anesthesia and can be performed at one time or in several stages, depending on the general condition of the patient. The results of the operation depend on its performance according to indications and early development of the disease.

Semana Médica, Buenos Aires

44: 313-392 (Feb. 4) 1937. Partial Index

*"Restrained" Symphysiotomy. J. H. Arrieta Yúdice.—p. 316.
Treatment of Acute Nutritional Disturbances of Infants. A. Rascovsky.—p. 326.
Fatal Recurrent Spontaneous Meningeal Hemorrhage: Case. A. Casiello.—p. 341.
Mediastinal Syndrome from Foreign Body in Esophagus: Case. A. Segers and G. Bayley Bustamante.—p. 361.
Vaginal Colpohysterectomy in Treatment of Uterovaginal Prolapse in Menopause. E. Bardi, A. H. Molfino and R. A. Boero.—p. 372.

Restrained Symphysiotomy.—According to Arrieta Yúdice, the technic of Zárate and Ortiz Pérez in "restrained" symphysiotomy is of value for the management of labor in cases of contracted pelvis. The operation, with slight variations, may be described by the following technic: puncture of the skin at the middle of the symphyseal interarticular line and progressive section of the interarticular fibrocartilage and of the arcuate ligament up to the upper border of the symphysis, hemostasis and suture of the opening of the original puncture. The ligaments at the point of insertion of the abdominal muscles are left undisturbed. They form the limit of a pubic diastasis of 4 or 5 cm., which results from the section of the interarticular fibrocartilage and of the arcuate ligament and prevent further opening of the diastasis. The operation is partial and almost subcutaneously performed and permits uneventful delivery of the fetus. Hemorrhages, symphyseal and presymphyseal suppuration, hematoma and incontinence of the urine do not follow the operation, and disturbances of the gait and genital prolapse are not late complications. Owing to the fact that late pubic consolidation takes place by fibrous proliferation, the amplitude of the pelvis induced by the operation is permanent.

Medizinische Klinik, Berlin

33: 185-220 (Feb. 5) 1937. Partial Index

Juvenile Hemorrhages Resulting from Cystic Glandular Hyperplasia and Effect of Hormones of Anterior Lobe of Hypophysis. H. O. Neumann.—p. 189.
Thyroid and Circulation. J. Rihl.—p. 193.
*Enterococcic Meningitis. B. Kemkes.—p. 196.
Swimming Pool Infections. Poelchau.—p. 197.
Diabetes Problem. R. Pick.—p. 198.
Depth Action of Short Waves. J. Kowarschik.—p. 200.

Enterococcic Meningitis.—After pointing out that meningitis of enterococcic origin is comparatively rare, Kemkes reports two cases that were recently observed at his clinic, both of which had a fatal outcome. In the first case the necropsy revealed a purulent meningo-encephalitis, in the second case a purulent leptomeningitis. The bacteriologic examination of the first patient disclosed enterococci in three specimens of cerebrospinal fluid and, during the necropsy, in two pus foci of the brain; in the second patient enterococci were found in one specimen of cerebrospinal fluid and, during necropsy, in a pus focus at the cerebellopontile angle. The strains of enterococci were subjected to various tests and it was found that the enterococci were of the type B in both patients. Since the enterococci were present in pure culture in the spinal fluid as well as in the pus foci, the author thinks that it cannot be doubted that they caused the fatal meningitis.

Monatsschrift f. Geburtshülfe u. Gynäkologie, Berlin

104: 1-128 (Dec.) 1936. Partial Index

Pathogenesis of Premature Detachment of Placenta. K. Heim.—p. 1.
Biologic Estimation of Menstruation and Pregnancy. A. Greil.—p. 23.
*Calcium Content of Blood in Tetany Resulting from Instability. R. Spiegler and W. Henkel.—p. 42.
Extraperitoneal Endometrium of Fossa Ovalis Femoris and Tar Cysts of Both Ovaries. F. Stähler.—p. 53.
Uterus in Case of Cystic Mole. G. Traina.—p. 82.
*Mumps and Female Genitalia. H. Bosch.—p. 99.
Genesis of Polyposis of Mucous Membrane of Corpus Uteri. W. Pieper.—p. 102.

Calcium Content of Blood in Tetany Resulting from Instability.—Spiegler and Henkel point out that conditions like tetany, osteomalacia, rickets and pregnancy, which are accompanied by disturbances or changes in the potassium-calcium content, are caused by endocrine or similar changes, so that it seems justified to attempt a modification of the calcium metabolism by endocrine therapy. They decided to investigate whether every disturbance in the hormone metabolism is accompanied by changes in the potassium-calcium content. They studied the potassium-calcium content during the intermenstrual and during the menstrual period, employing the electro-ultrafiltration method of Bechold. Tabular reports indicate that in the examined cases the total calcium content was increased; the total potassium content, on the other hand, was reduced. This, of course, is in keeping with the antagonistic character of the two minerals. However, the ultrafiltrable portions of the two minerals showed the same behavior; they increased noticeably during the menstrual period. Entirely different was the behavior of the electro-ultrafiltrable portions of the two minerals; whereas that of calcium was increased during the menstrual period, that of potassium was reduced. The authors further studied the response of the potassium-calcium content to the administration of glandular products during the different menstrual phases. They found that the administration of parathyroid extract produces an increase in the potassium-calcium values during the intermenstrual as well as during the menstrual period. However, the values are not higher than those observed in other cases, so that the total potassium-calcium content of the blood is not more strongly influenced by the parathyroid extract during the menstrual period than is the case outside it. The authors describe two cases of tetany that developed during menstruation and in which no essential changes in the calcium metabolism could be detected. They demonstrate that the calcium metabolism was not changed as it should have been if the tetany was of the thyroprival type and so they designate both cases as pure instability tetanies. They think that the fever, particularly its sudden increase, was

the eliciting factor for the tetany. Another case is cited in which sudden heat stasis produced an attack of tetany outside the menstrual period.

Mumps and Female Genitalia.—Bosch observed that, among the women who came under his observation for sterility, a large number had genital hypoplasia. He thinks that in many of these cases the genital hypoplasia might be the result of the malnutrition during and after the war. However, he also found that the anamnesis frequently revealed an attack of mumps during the prepuberal or puberal age and in many of these cases it was stated that the mumps had been accompanied by pains in the lower part of the abdomen. After directing attention to the concurrence of mumps with orchitis, he points out that some authorities believe that mumps may also cause oophoritis. He himself thinks that the development of mumps during the puberal age and the fact that later genital hypoplasia and sterility are often observed in such patients indicate that disorders of the female genitalia are comparatively frequent after mumps. These disorders probably inhibit further development. Moreover, there is a possibility that other incretory glands, for instance the hypophysis, may become impaired by the mumps. Disorders of the hypophysis could of course result also from the meningitis that is known to occur in mumps. The author says that, as regards fertility, the prospects of endocrine therapy are not favorable.

Münchener medizinische Wochenschrift, Munich

84: 241-280 (Feb. 12) 1937. Partial Index

Clinical Significance of Hematuria. W. Nonnenbruch.—p. 241.
*Influenzal Peritonitis. Uebermuth.—p. 243.
Remarks on Function of Blood in Patients with Circulatory Disorders. G. Zaeper and H. Olmes de Carrasco.—p. 245.
Agranulocytosis and Hypersensitivity to Aminopyrine. H. Disselmeyer and O. Zorn.—p. 247.
Impairment of Corpus Striatum After Use of Potent Anesthetics. H. Schmitz.—p. 249.
*Functional Pathology of Diverticulosis of Colon: Question of Late Results of Lead Poisoning. J. Hartmann.—p. 252.

Influenzal Peritonitis.—Uebermuth observed in the course of an influenza epidemic a case of influenzal peritonitis after an initial temporary enteritis. The clinical manifestations were those of an advanced ileus, so that an operation was resorted to. This disclosed a diffuse suppurating peritonitis with subserous focal hemorrhages. These aspects, together with leukopenia, conjunctivitis, initial diarrhea and the development in the course of an influenza epidemic, led to the diagnosis of a genuine peritonitis of influenzal origin. But, although the later course of the case proved that the laparotomy had been unnecessary, the author thinks that under similar conditions reliance on conservative measures is not always justified, because the differential diagnosis is so difficult that, in order to prevent diagnostic errors, laparotomy is advisable whenever there is the least doubt.

Diverticulosis of Colon, Particularly After Lead Poisoning.—Hartmann shows that from the anatomic point of view there is a difference between true diverticula, in which there is a protrusion of the entire intestinal wall, and acquired or false diverticula, in which only the mucosa and submucosa are involved. The first type is usually found on the jejunum and ileum, the second type usually on the colon, especially its sigmoid portion. The author discusses the acquired form, pointing out that old age, obesity and intestinal ptosis are factors predisposing to weakness of the intestinal wall and that peristaltic pressure fluctuations may produce diverticula at sites where the intestinal wall is weak. He devotes himself principally to chronic spastic constipation as cause of the formation of diverticula and particularly their occurrence in lead poisoning. Persons who have had lead poisoning frequently complain in after years of chronic constipation, digestive disturbances and colic. If such patients do not exhibit signs of late sequels of lead intoxication, a connection of the intestinal disorders with the lead poisoning is usually rejected. However, the author describes two cases which demonstrate that late intestinal symptoms may be the manifestation of diverticulitis and colitis and these in turn probably the result of an earlier lead intoxication. The examination revealed in the first case colitis and diverticulitis and in the second case diverticulosis of the transverse colon. Both patients had a history of lead poisoning and chronic spastic constipation and the author concludes that it is justified to assume a connection between lead intoxication and constipation on the one hand and the formation of diverticula on the other hand.

Strahlentherapie, Berlin

58: 1-192 (Jan. 23) 1937. Partial Index

Influence of Irradiation of Thyroid on Ovary. E. Momigliano.—p. 53.
*Roentgen Treatment of Hyperthyroidism. P. Hess.—p. 74.
Use of Weak Radium Therapy in Dermatology. S. R. Brünauer.—p. 83.
Investigations on Ultraviolet Dosimetry. W. Friedrich and E. Fischer.—p. 94.
*Modification of Action of Roentgen Rays on Malignant Tumors by Injection of Sugar and Insulin. K. Inouye.—p. 125.
Photographic Procedure for Testing Density of Radium Preparations. K. G. Zimmer and P. M. Wolf.—p. 174.

Roentgen Treatment of Hyperthyroidism.—Hess reports the results of roentgen therapy in 140 cases of hyperthyroidism. He shows that among the patients who were not influenced or only somewhat improved there were many in whom the treatment had been inadequate. He stresses the necessity of an adequate total dose and of a correct psychologic treatment. There is no mortality as the result of irradiation; on the other hand, there are many severe cases that are unsuitable for other treatments and yield only to irradiation.

Injection of Sugar and Insulin in Roentgen Therapy of Malignant Tumors.—Inouye shows that the efforts to improve the effect of irradiation on tumors tend in two directions; either the ray dosage is changed or the developmental conditions of the tumor are altered. He tried to change the tumor metabolism. He describes experiments on rabbits which proved that the intravenous injection of sugar solution increases the metabolism of the rabbit sarcoma. It was also found that the injection of sugar solution before the irradiation increases the action of roentgen rays on the rabbit sarcoma in that the inhibiting action of the rays is increased. The injection of insulin after the roentgen irradiation supports the inhibiting action of roentgen rays. Thus it is advisable to inject insulin in order to prolong the effect of the roentgen rays. The injection of sugar solution alone improves the general condition of the animals but also the growth of sarcoma. The roentgen irradiation alone reduces the size of the tumors but also impairs the general condition and shortens the life of the animals. The combination of the injection of sugar solution with roentgen irradiations inhibits the tumor growth and prolongs the life of the animals.

Wiener klinische Wochenschrift, Vienna

50: 211-242 (Feb. 19) 1937. Partial Index

*Clinical Significance of Nonprotein Nitrogen. W. Nonnenbruch.—p. 211.
Studies on Resorption in Rectum in Normal Persons and in Those with Habitual Constipation. M. Taubenhaus and E. Amann.—p. 214.
*New Indication for Total Extirpation of Thyroid. C. Ewald.—p. 217.
Correlations of Hypophysis and Diencephalon. W. Raab.—p. 218.
New Tube for Blood Transfusion. W. M. Kreiner and R. Neurauter.—p. 222.

Clinical Significance of Nonprotein Nitrogen.—Nonnenbruch defines nonprotein nitrogen as the nitrogenous constituents of the body fluids and tissues that remain after removal of the proteins. The normal quantity of nonprotein nitrogen amounts to about 30 mg. per hundred cubic centimeters. About one half of the nonprotein nitrogen is accounted for by urea and the other half is made up of a number of substances, collectively designated as nonureal rest nitrogen or residual nitrogen, which includes different substances from simple ammonia to complicated products of protein cleavage. He points out that the so-called differential rest nitrogen (D N) has received considerable attention as an indicator of toxic protein decomposition or of the presence of polypeptides. However, his own investigations revealed that the so-called differential rest nitrogen is an entirely unreliable factor. An increase in the residual nitrogen does not signify a renal disturbance, for its constituents are not eliminated as such in the urine but undergo further changes in the intermediate metabolism. An increase in the nonprotein nitrogen does not necessarily indicate renal insufficiency. Increased residual nitrogen values suggest a disturbance in the intermediate metabolism, which is found chiefly in hepatic disturbances that are not always severe. Occasionally increased values are found in syphilitic patients

after treatment with arsphenamine or in hepatic cirrhoses. The highest values are generally observed in cases of acute yellow atrophy. The author reports that, in collaboration with another investigator, he detected a relationship between the residual nitrogen and the urea nitrogen. He cites observations which indicate that urea has an especial significance for the normal and complete course of the intermediate protein decomposition.

Extirpation of Thyroid in Severe Cardiac Defects.—Ewald reviews the results of total thyroidectomy in cases of severe heart disease. Another case is cited in which the thyroidectomy improved the cardiac disorder, but myxedema developed, which could not be adequately influenced by thyroid preparations. The patient became cachectic and died two months later. The author cites several investigators who advise caution in view of the fact that the late results of total thyroidectomy cannot be foreseen; however, he also admits that sudden and considerable improvements have induced others to disregard possible dangers. He himself is of the opinion that as yet total thyroidectomy is not justified when medicinal therapy fails in severe cardiac defects. He thinks that this attitude is permissible until it has been definitely proved that subtotal extirpation of the thyroid is inadequate in such cases.

Polska Gazeta Lekarska, Lwów

16: 157-172 (Feb. 28) 1937

*Roentgen Therapy in Abscess of the Lungs. P. Adamowicz and Z. Kulig.—p. 157.
Social-Pathologic Significance of Rheumatism and Its Conquest. Marian Kowalski.—p. 160.
Antistreptin Therapy in Erysipelas. Marta Baranowska.—p. 162.
*Severe Erysipelas Treated with Hydrochloride of Sulfamidochrysoidyn (Prontosil"): Three Cases. J. Gotlib.—p. 163.
Prognosis and Course of Confinement in Primiparas with Unfixed Head Presentation at Termination of Pregnancy. M. Kosiński.—p. 165.

Roentgen Therapy in Abscess of the Lungs.—Adamowicz and Kulig report their results with the use of roentgen rays in eleven patients who suffered from abscess and necrosis of the lungs. Complete recovery occurred in eight cases; two patients died during treatment, although at first they showed signs of improvement, and one patient relapsed after having been apparently on the road to recovery for ten weeks. It is remarkable that each patient treated with roentgen rays became worse after the first and sometimes after the second application: the patients felt weak and exhausted and their temperature rose, although their cough diminished and became milder, but after the third application a marked improvement could be noticed. The roentgen dosage and the intervals between treatments cannot be schematized but must be regulated according to individual cases.

Treatment of Erysipelas with Prontosil.—Gotlib says that the question of how to treat erysipelas has not yet been solved. In one hospital during the last three years there were more than 700 cases with a mortality rate of 6 per cent. All kinds of medication have been tried, with little success. Lately a dye derivative of sulfanilamide (prontosil) has been tried. Gotlib reports three cases of severe erysipelas successfully treated with this substance. One was a case of inflammation of the tibia of eight years' duration, which was healing slowly but erysipelas developed; the other two were cases of erysipelas of the face. To all patients he administered orally six tablets of this preparation a day. Marked improvement was noted in twenty-four hours and complete recovery occurred in a few days. The amounts used in the three cases were 4.8, 6.2 and 7.2 Gm.

Sovetskaya Khirurgiya, Moscow

Pps. 573-782 (No. 10) 1936. Partial Index

Mechanism of Intracranial Pains. W. Penfield.—p. 586.
*Pathogenesis of Jacksonian Epilepsy. A. Sozon-Yaroshevich.—p. 597.
Cisternal Puncture as Auxiliary Diagnostic Method in Brain Tumors. Ya. M. Pavlonskiy.—p. 602.
Osteoblastic Meningiomas. I. S. Vaskin.—p. 610.
Clinical Course of Medulloblastoma. A. I. Geymanovich and E. M. Khaet.—p. 616.
Results of Treating Hydrocephalus with Endoscopic Coagulation of Choroid Plexus. T. Putnam.—p. 624.

Jacksonian Epilepsy.—On the basis of a study of eighty-two cases of jacksonian epilepsy in which operation was performed at the Traumatologic Institute of Leningrad, Sozon-Yaroshevich concludes that the primary cause of the condition has not been elucidated. Among the cases studied were motor, sensory and sensorimotor types. The average time elapsed between the primary disease or trauma and the onset of epileptic convulsions was three and one-half years. The etiologic factors may be of a most varied kind. In their material there were thirteen cases (15.8 per cent) of neoplasm, four (4.8 per cent) of parasites (Echinococcus, cysticercus), twenty-nine (35.4 per cent) of inflammatory-degenerative type, such as typhus, meningitis and grip; twenty-one cases followed open trauma and fifteen (43.9 per cent) concealed trauma. It is not the primary disease but the pathologic alterations caused by it in the brain and its functions that are responsible for the epileptic seizures. The pathologic changes found were of a chronic type. These were edema and thickening of the pia and the arachnoid, hyperemia and new blood vessel formation, localized serous arachnoiditis with partial localized obliteration of the subarachnoidal space, and formation of scar tissue along the course of the blood vessels. These alterations were found in all the cases. On the other hand, alterations in the cortex in the form of scars, softening or thickening with some edema and hyperemia of the pia were found in only half of the cases. Alterations in the dura mater and the bone with ecchymoses, new blood vessel formation and thickening of a diffuse sclerosing type and scars were even less frequent. These pathologic changes are not essential for the production of epilepsy, as they were absent in a number of the cases. The least frequent alterations were those found in the subcortical zone in the form of scars of the white substance or of foreign bodies, such as a bullet, bone or cyst. The most constant were the chronic alterations of the arachnoid and of the cerebral blood vessels. Their localization was most varied. It was found not only in the sensorimotor zone but likewise in the frontal, temporal and occipital localizations. The author concludes that the pathologic alterations in the arachnoid with obliteration of the subarachnoidal space and the changes in the cerebral blood vessels with consequent disturbance in the circulation of the cerebrospinal fluid constitute the essential alterations in epilepsy. The scars on the surface of the brain or in its substance are of importance only so far as they are capable of causing alterations in the lymphatic circulation and the distribution of the cerebrospinal fluid in the subarachnoid space of the large hemispheres.

Nederlandsch Tijdschrift voor Geneeskunde, Haarlem

81: 749-856 (Feb. 20) 1937. Partial Index

Asthenopia and Its Significance for Medical Practitioner. J. Piekema.—p. 753.
*Encephalitis and Infection. S. Heringa.—p. 760.
*Influence of Liver Extract on Cholesterolemia and Psychotic Aspects of Involution Melancholia. J. A. T. Ligterink, C. Simons and N. Speijer.—p. 768.
Paget's Disease of Nipple. W. L. L. Carol and J. R. Prakken.—p. 771.
Hydrocephalus in Twins and Studies on Heredity. J. A. Stroink.—p. 779.

Encephalitis and Infection.—Heringa reports the case of a youth, aged 16, who, in the course of a septic infection originating in an injury on the left hand, developed a cerebral disorder with the clinical aspects of lethargic encephalitis. Further the author describes three cases of disseminated encephalomyelitis in which the influence of focal infection is evident. He assumes that preexisting neurotropic viruses were activated by the focal infection. Attention is called to the danger involved in dental interventions in neurotropic infections.

Influence of Liver Extract on Melancholia.—Ligterink and his associates point out that Georgi resorted to the injection of adrenal cortex extract in patients with involution melancholia because it is known that this extract reduces the cholesterol content, which is increased in those patients. According to Georgi's report he not only reduced the cholesterol content but also improved the psychotic aspects. The authors point out that these results give rise to several problems, particularly the question whether the improvement in the psychotic disorder is the result of the reduction in the cholesterol content. In trying to answer this question the authors gave injections of liver extract to six patients with involution melancholia. They found that the injections resulted in a reduction of the previously increased cholesterol content of the blood, but they observed no change in the mental condition of the patients. From this observation they conclude that the therapeutic results produced by Georgi cannot be entirely ascribed to the cholesterol reducing action of adrenal cortex extract.